Western Regional Corridor Study

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Prepared for
Western Utility Group
By
MICHAEL CLAYTON & ASSOCIATES

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Department
of the
Interior

Bureau of Land Management
Washington, D.C. 20240

Department
of
Agriculture

Forest Service
Washington, D.C. 20013

Reply to: BLM: 1623, 2800
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To: BLM: State Directors
FS: Regional Foresters, R-1, R-2, R-3, R-4, R-5, R-6

This letter endorses the recently released "Western Regional Corridor Study" by the Western Utility Group. We are committed to using the Corridor Study as a reference document when considering land use decisions that may affect existing and/or proposed major utility corridors. Copies of the study are being distributed by the Western Utility Group to Forest Supervisors and Resource Area Managers.

The Western Utility Group is an ad hoc organization of major western gas, electric, and telecommunication companies. The Western Regional Corridor Study has spanned a period of almost 2 years and was coordinated closely with agency field units throughout the western United States. The study is an important step in coordinating future land use decisions regardless of our Federal jurisdictional boundaries.

The Western Regional Corridor Study is not a decision document, rather it is a reference document which both agencies need to consider when amending or revising land and resource management plans and when considering all forms of site-specific projects on lands administered by the two agencies.

A joint implementation plan has been developed by the two agencies and the Western Utility Group to respond to the study's recommendations and promote ongoing dialogue on corridor needs. A copy of that plan is enclosed. You will note that we are committed to take specific actions.

This study is the most comprehensive one of its kind done to date and will provide an invaluable coordination and communication tool to facilitate planning and providing services to people and communities. We appreciate your continued support and commitment in strengthening our inter-agency cooperation and working relationship with the Western Utility Group.

for Chief, USDA Forest Service

Director, USDI Bureau of Land Management

Enclosure

ACKNOWLEDGEMENT

When members of the Western Utility Group decided to undertake an update of its *Western Regional Corridor Study* we never imagined that it would evolve into a project of such magnitude. Who would have guessed that it would take almost three years and the combined efforts of over 60 utilities, together with the Washington, D.C., state and local offices of the Bureau of land Management and Forest Service, to complete? I am extremely proud to have been able to work with those individuals who have spent so much time and effort to make this study the success that it is.

One of the greatest benefits to come out of the *Western Regional Corridor Study* was the opportunity for the utility industry to work in close cooperation with the various BLM and Forest Service personnel. The enthusiastic cooperation and assistance that was provided by the two federal agencies opened the eyes of many of the utility company participants, who discovered that a mutually beneficial relationship was possible. In addition, many of the federal agency personnel found that the utility industry had deep concerns for the environment, and a true conviction to provide the citizens of the western United States with reliable and economical energy and telecommunication service. At the very least, both the Federal Land Management Agencies and the Utility Industry will have a much better understanding as to the challenges each face in completing their jobs.

Literally hundreds of people have participated in completing this project and it would be impossible to list them all. If I do not get another chance to thank you individually please accept my sincere appreciation for the efforts you have provided. Without your help we would not have been able to get this project off the ground.

There are several people who deserve special mention. To begin with, I would like to thank the Western Utility Group's Oversite Committee who unselfishly committed their time and effort to help me see this project through. The Oversite Committee members are: Jack Steck, Public Service Company of Colorado; Don Hirschenhofer, MCI Telecommunications Corporation; Don Smith, US West Telecommunications Company; and Sharon O'Rourke and Dennis Montoya, Southern California Gas Company.

Special mention also goes to Bob Groh at Pacific Gas and Electric Company (PG&E). Through Bob's efforts, PG&E printed the preliminary check maps and the final text. It should be noted that PG&E has taken a lead role on all three of the *Western Regional Corridor Studies* completed to-date.

Other Western Utility Group members who went above and beyond the call of duty were: Ken Baker, Salt River Project; Joe Cleary, Nevada Power Company; John Hooson, Bonneville Power Administration; Bruce Jensen, Pacificorp; John Lawson, Arizona Public Service; Dave Meyers, Idaho Power Company; Gerry Prior, Puget Sound Power and Light Company; Dale Raugett, Pacificorp; Pat Reardon, Montana Power Company; and Steve Younkin, Sierra Pacific Power Company. These individuals served as State Coordinators, sounding boards, and text reviewers and performed any other service asked of them in completing this project.

In addition, there are several BLM and Forest Service employees who deserve acknowledgement for their contributions to the *Corridor Study*. They are: Ken Myers, USDA-Forest Service, Washington, D.C.; Joan Comanor, USDA - Forest Service, Washington, D.C.; Berwyn Brown, USDA - Forest Service, Washington, D.C.; Bill Weigand, BLM, Boise, Idaho (BLM's direct liaison with the Western Utility Group on this project); Tom Walker, BLM, Washington, D.C.; Matt Millenbach, BLM, Washington, D.C.; Mike Penfold, BLM, Washington, D.C.; Bob Barney, BLM, Sacramento, California; Ted Albert, BLM, Portland, Oregon; Eric Stone, BLM, Portland, Oregon; Larry Gash, USDA-Forest Service, Denver, Colorado; Ben Wallingford, USDA-Forest Service, Denver, Colorado; and Mike Berch, BLM, Washington, D.C. I would also like to express my special thanks to Jim Colby, BLM, Washington, D.C. Jim has played an instrumental role in seeing this project to completion, as well as providing input throughout the *Study* process. Jim was instrumental in the development of the implementation plan. Those long hours we spent putting ideas to paper were well spent and I sincerely thank you for all of your support and assistance.

And to the other participants not mentioned here, please know that I am aware of, and appreciate all of your efforts. Without the total cooperation and assistance of all those involved in the project, there would not be a *Western Regional Corridor Study*. Thank you all.

Carl Barnett, Sierra Pacific Power Company
Project Manager, *Western Regional Corridor Study*

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CHAPTER 1
INTRODUCTION

"In the past we have had limited data available to incorporate utility corridor planning into our planning process. This effort [the Western Regional Corridor Study] will provide important information necessary to consider as we revise and amend plans to meet a broad spectrum of public needs. Both of us are enthusiastic about the Study and recognize the benefits that will be derived."

Cy Jamison, Director, Bureau of Land Management
F. Dale Robertson, Chief, US Forest Service

Between Topaz Lake (on the California-Nevada state line) and the Owens Lakebed (to the south) remarkably varied terrain can be found. The high desert range; rugged Sierra escarpments; glaciated valleys; and alpine forests, meadows and lakes combine to create a dramatic landscape. In 1990 this area was the subject of a cooperative Bureau of Land Management (BLM)/Forest Service/Utility Industry Corridor Study. It was the first such joint Agency/Industry corridor study and included the assistance of local utility companies and the participation of the public. The goal of the Topaz Lake-Owens Valley Study was to assess the possible opportunities for utility corridors between Nevada and southern California.

Utility corridors are a diminishing resource that need to be addressed in federal land planning efforts.

The study process was a resounding success. The results, however, were alarming. When viewed in the context of the California Desert District Conservation Plan (which guides the management of the southern portion of this region), only two possible East-West corridors were identified. Other potential routes were excluded from consideration because of federal legislation, restrictive land use regulations, extreme topography or restricted land uses such as Wilderness Areas, Indian Lands, Wildlife Refuges, National Parks and National Conservation Areas. Neither route was designated as a corridor in the ensuing BLM Land Management Plan, and the end result is that a 310-mile portion of the California-Nevada border, from Topaz Lake to Interstate 15, may not be accessible for future utility corridors.

The Topaz Lake-Owens Valley Study is just one example of a situation that is becoming more common throughout the west: utility corridor opportunities are diminishing and need to be addressed in federal land planning efforts. The Topaz Lake-Owens Valley Study also demonstrates the need for a cooperative effort between federal land management agencies and the electric and gas utility, pipeline and telecommunications industries for effective regional corridor planning.

CORRIDOR PLANNING IN THE 1970'S

Prior to the mid-1970s, no consideration was given to the concept of utility corridors. Utility route selection revolved around the theory that the most viable and economic routing choice was a straight line between the source and the delivery point. Any deviations in routing were made only to avoid geologic problems, land ownership constraints or known environmental concerns.

Then, in 1975, conservation organizations, federal agencies and the utility Industry recognized the need to establish a planned, interconnected, regional corridor system in the western United States. This need was identified based on population growth, relocation of industry and regulatory constraints on the siting of new energy production facilities. A planned corridor system would accommodate growth in energy transmission facilities in an efficient manner that would minimize adverse environmental impacts, while allowing logical and efficient development of energy transmission systems.

A planned corridor system would accommodate growth in energy transmission facilities in an efficient manner that would minimize adverse environmental impacts.

The most definitive publication available on corridor planning during this period was the US Department of the Interior's (DOI) *"The Need for a National System of Transportation and Utility Corridors"*. This report, published on July 1, 1975 as directed by Section 28(s) of the Mineral Leasing Act of 1920 and as amended in 1973, established a clear direction for the future of utility planning on public lands. Federal agencies expected to become more active participants in utility route selection and increased public participation in decisions affecting route selection was anticipated. While the consolidation or relocation of existing facilities was not expected as a result of the new utility planning guidance, it was believed that the proliferation of separate rights of way would be discouraged by federal land management agencies.

Congress recognized the findings of the DOI study by incorporating nearly identical language from Section 28(s) of the Mineral Leasing Act into the Federal Land Policy and Management Act of 1976 (FLPMA). Section 503 of FLPMA goes beyond the stated goal of preventing "the proliferation of separate rights of way" by encouraging the Secretaries of Agriculture and the Interior to "issue regulations containing criteria and procedures for designating [transportation and utility] corridors" (see Chapter 2). Further, Congress conferred the necessary authority to the appropriate Secretary to designate existing corridors "without further review." Section 103 and Title II of FLPMA define rights of way as a "principal or major use" of federal lands and requires their consideration in the land use planning process.

The National Forest Management Act (NFMA) of 1976 established similar requirements for forest plans. As noted in the 1975 DOI study, planning for specific, rigidly defined corridors is infeasible without project-specific information. The appropriate planning tool was clearly the establishment of corridors capable of containing compatible rights of way.

In 1977, an ad hoc organization of representatives from primarily investor-owned electric, gas, water and communication utilities was formed: the Western Utility Group (WUG). The member companies of the WUG are based in the Western United States and provide approximately 75 percent of the West's energy and communication needs.

The fundamental purpose in establishing the WUG was to provide an open forum for discussion of federal regulations, specifically those regulations promulgated as a result of FLPMA. The group has expanded its purpose to include other federal land use issues that impact the utility companies in the Western United States. More specifically:

"The Western Utility Group is an ad hoc committee originally comprised of utilities (primarily investor owned) from the eleven western states whose purpose is to:

- ***(i)*** *review and comment on federal land use legislation, policies or regulations, as they arise, that could have an impact on issues such as corridor planning and right of way permit procedures; and*
- ***(ii)*** *prepare and provide information supportive of its members' collective positions to governmental agencies.*

The WUG will act when the members determine there is good reason to believe that their position would not otherwise be adequately presented to the appropriate governmental agencies."

Federal Land Use Regulations Adversely Affecting the Western Utility Industry, Status Report, Western Utility Group, October 1988.

FLPMA defines rights of way as a "principal or major use" of federal lands, and requires their consideration in the land use planning process.

By 1979, restrictions on land uses were being enforced throughout the United States and the first federal land use plans had begun. However, many of the first land use plans did not address the issue of utility corridors as outlined in Section 503 of FLPMA. The WUG recognized that these newly created federal land use designations, combined with the lack of utility corridor designation in the federal land planning process, could constrain the utility Industry's ability to maintain energy and communication transmission systems. The WUG had vital concerns regarding policy differences among planning units of different agencies as well as concerns about energy transportation, communications expansion/upgrading, and the transportation of raw

materials and manufactured commodities. The WUG approached the BLM and Forest Service with these concerns, and in turn, the BLM and Forest Service requested that the WUG provide the federal agencies with the necessary information documenting the utility Industry's corridor needs.

CORRIDOR PLANNING IN THE 1980'S AND THE *WESTERN REGIONAL CORRIDOR STUDY*

In response to the federal agencies' request for corridor information, the WUG organized the *Western Regional Corridor Study* Committee. This Committee included over 100 federal right of way users such as private electric utilities, pipeline companies, communication companies and railroads, and was responsible for preparing a study on Industry corridor needs in the eleven western states.

Federal land use designations, combined with the lack of utility corridor designations in the federal land planning process, could constrain the utility Industry's ability to maintain energy and communication transmission systems.

The primary goals of the *Study* were to establish utility and transportation corridors on a regional basis and identify local Industry coordinators to contact for further information. The resulting 1980 *Western Regional Corridor Study* demonstrated the need to:

1. Balance competing land uses;
2. Develop public policy allowing alternatives for uses precluded or foreclosed due to statutory constraint;
3. Review land use policy through public disclosure and commentary; and
4. Improve land management policy through the land planning process.

The 1980 *Study*, which included individual state maps depicting both existing and proposed corridors, was distributed to virtually all administrative units of the BLM and the Forest Service throughout the eleven western states.

During the next few years the WUG worked with the BLM and the Forest Service and made specific suggestions on regulatory reform believed to be consistent with legislative direction and the objectives of the President's Task Force on Regulatory Relief. Among the WUG's suggestions was the designation of regional utility corridors in federal land use plans. The WUG encouraged the BLM and Forest Service to work together to assure corridor continuity throughout different jurisdictions. It was believed that policies, guidelines and standards for corridor designation needed to be consis-

tent on a regional basis to successfully implement the FLPMA mandate of encouraging corridors by discouraging the proliferation of separate rights of way.

In 1985, the WUG determined that it was necessary to provide a status report on corridor planning efforts, refine and restate the corridor concept, update the 1980 corridor network data and place more emphasis on the regional aspects of utility corridors. The result was the 1986 *Western Regional Corridor Study*.

The 1986 *Corridor Study* effectively illustrated the difficulties that were encountered in attempting to implement the regional corridor infrastructure envisioned by the 1975 DOI report and as required by Congress. In addition to providing state-wide corridor networks on individual state maps, the 1986 *Corridor Study* also graphically illustrated the variation in corridor designation policy throughout the BLM and Forest Service planning jurisdictions. Delegation and dispersal of Agency responsibility had led to a multitude of interpretations of Congressional intent, priority and need concerning corridor planning. Within the federal land management agencies, corridor policy ranged from designation of corridors to the non-consideration of corridors. The 1986 *Corridor Study* reiterated two previous Industry concerns:

The 1986 *Corridor Study* effectively illustrated the difficulties that were encountered in attempting to implement the regional corridor infrastructure envisioned by the 1975 DOI report and required by Congress.

1. Corridors must be designated on a regional network basis, and
2. Management directives assuring that utility corridors are considered and designated in all land use plans.

Between the publication of the 1986 *Corridor Study* and the development of this *Western Regional Corridor Study*, the WUG and other Industry representatives have worked with the BLM and Forest Service as specific Land Management Plans and Forest Plans have been developed. All parties involved now recognize the need to make utility corridors a part of all planning and management activities, realizing that the challenge of providing consistency in corridor planning throughout the various agencies still exists.

CHAPTER 2
THE IMPORTANCE OF DESIGNATED CORRIDORS TO LONG TERM UTILITY PLANNING

In an era of diminishing utility right of way opportunities, it is critical that utility corridors be extended the same protection afforded other competing land uses and valued resources (i.e. grazing, timber harvesting, wildlife refuges, archaeological sites and wild and scenic rivers). As Interior Secretary Bruce Babbitt articulated during his confirmation hearings: *"...there is no longer enough space to accommodate every competing use on every section of public domain...choices will have to be made."* The Western Utility Group contends that the choices referred to by Secretary Babbitt must include the formal designation of future utility corridors in the BLM and Forest Service land management plans, in order to ensure efficient energy and telecommunication service for growing population centers. While the designation of corridors will enhance the security of facility siting and service reliability in the future, it will not necessarily guarantee the availability of these areas when needed. This seemingly contradictory statement becomes more clear as we gain a better understanding of what exactly constitutes a corridor and what benefits and limitations can be anticipated with wide-spread corridor designation.

It is critical that utility corridors be extended the same protection afforded other competing land uses and valued resources.

THE DEFINITION OF A CORRIDOR

Among the federal land management Agencies and utility Industry, the definition of a corridor varies. The Western Utility Group defines a corridor as:

"A linear strip of land without definite width, but limited by technological, environmental and topographical factors, and containing one or more utility, communication, or transportation facilities. A corridor is a land use designation, identified for the purpose of establishing policy direction as to the preferred location of compatible linear facilities and compatible and conflicting land uses. It does not imply entitlement of use. Appropriate environmental review and regulatory permitting must precede occupancy on a project-specific basis."

The BLM uses the 43 Code of Federal Regulations (CFR) 2800.0-5 definition of an existing corridor which characterizes corridors as *"a parcel of land, without fixed limits or boundaries, that is being used as the location for one or more transportation or utility rights of way"*. Some Forest Service plans use the definition of a corridor provided in 36 CFR 219.3 which states that a corridor is *"a linear strip of land identified for the present or future location of transportation or utility rights of way within its boundaries."*

While these three corridor definitions hold a common theme – the designation of land with boundaries – it is apparent that for regional corridor planning to become more effective, federal land management Agencies and the utility Industry must arrive at a consensus definition. The primary difference between the WUG definition and that used by the federal land planning Agencies is that, in most cases, the Agency management plans specify a particular corridor width acceptable to that particular jurisdiction. An example of an Agency corridor description that more closely approximates the WUG corridor definition is provided in the BLM's 1980 management plan for the California Desert Conservation Area. While the BLM did not attempt to provide a conclusive statement defining a utility corridor, the Plan does state that:

In order for regional corridor planning to become more effective, federal land management agencies and the utility industry must arrive at a consensus definition for a utility corridor.

"Planning corridors are a tool for guiding the necessary detailed planning and environmental assessment work which will continue to be required when a right of way is requested. The establishment of a planning corridor is not considered an automatic approval for a new right of way grant.

The joint-use planning corridors vary in width from two to five miles. (These two distance standards describe the width of the planning corridor). There is an acceptable two-mile standard for separation of existing facilities. A two-mile width generally provides sufficient flexibility in selecting alternate routes for a right of way. Also, a two-mile width generally provides sufficient space for evaluating a number of possible alternative routes.

The five-mile standard is selected where there is no existing facility and, therefore, little or no engineering and environmental data to define a narrower corridor alignment. It is also selected in those cases where there are so many facilities or merging corridors that a five-mile width is needed to ensure sufficient space for system integrity and flexibility."

Yet another example of how similar Industry/Agency corridor definitions are evolving is in Bonneville Power Administration's (BPA) *The Pacific Northwest Long Range East-West Energy Corridor Study*, where seven energy corridors are identified, each 600 feet wide. This width was considered sufficient since the *"separation between lines is assumed to be 200 feet with 100 feet edge distance, or a right of way 600 feet wide for the ultimate three lines per corridor."*

DESIGNATED CORRIDORS

As discussed in the previous chapter, the formal designation of utility corridors was first addressed in the Federal Land Policy and Management Act (FLPMA) of 1976. Strictly applied, Section 503 of FLPMA would discourage right of way

proliferation by encouraging the designation of corridors capable of containing more than one right of way. Specifically, FLPMA, Section 503, Right of Way Corridors, states:

"In order to minimize adverse environmental impacts and the proliferation of separate rights of way, the utilization of rights of way in common shall be required to the extent practicable, and each right of way or permit shall reserve to the Secretary concerned the right to grant additional rights of way or permits for compatible uses on or adjacent to rights of way granted pursuant to this Act. In designating right of way corridors and in determining whether to require that rights of way be confined to them, the Secretary concerned shall take into consideration national and state land use policies, environmental quality, economic efficiency, national security, safety, and good engineering and technological practices. The Secretary concerned shall issue regulations containing the criteria and procedures he will use in designating such corridors. Any existing transportation and utility corridors may be designated as transportation and utility corridors pursuant to this subsection without further review."

Title 43 CFR 2800.0-5 defines a BLM designated right of way corridor as:

"A parcel of land either linear or areal in character that has been identified by law, by Secretarial Order, through the land use planning process, or by other management decisions as being a preferred location for existing and future right of way grants and suitable to accommodate more than one type of right of way or one or more rights of way which are similar, identical or compatible."

Federal land management directions and increasingly restrictive land use legislation have made the BLM and Forest Service aware of the need to identify suitable locations for corridors.

Federal land management directives (since 1976), and increasingly restrictive land use legislation have made the BLM and Forest Service aware of the need to identify specific locations (within their jurisdiction) best suited for future corridors. It should be noted that while many of the BLM and Forest Service jurisdictions in the western United States address corridors in their land management plans, only about 50% of the jurisdictions designate corridors and/or actually map corridor locations.

WINDOWS

Another approach to preserving ROW opportunities is the designation of "windows". The purpose of identifying areas as windows of opportunity or avoidance is to assist permit applicants in determining potential siting problems so that routing alternatives or mitigation measures are incorporated into the application from the beginning. In addition to requiring the designation of corridors in well-blocked BLM land areas, the Oregon State BLM Office's right of way standards and procedures also requires the identification of avoidance

areas, or corridor windows, in scattered tract areas. Many BLM land use plans and amendments have also identified opportunities for designating corridor windows across canyons or between blocks of BLM and other Agency lands.

THE VALUE OF DESIGNATED CORRIDORS

The identification of corridors as a special category of land use within Agency planning areas, and the designation of corridors in land management plans, plays a key role in conserving future corridor locations. Bonneville Power Administration encourages the designation of corridors in their East-West Energy Corridor Study:

The designation of corridors can help to minimize the proliferation of rights of way and expedite the NEPA review process.

"Potential energy uses should be reserved now so present and future planners may recognize and accommodate the corridors vital to the future of the region in local plans. Interim management (until the time of actual energy transportation employment should be multiple use. To identify and use them for any other purposes would be unwise."

Both the BLM and the Forest Service designate corridors to concentrate facilities into a specific area or concentrated linear area. Through the consolidation of corridors, Agencies can minimize the number of separate rights of way, identify preferred locations for future rights of way, and establish joint-use planning corridors, thereby, minimizing the environmental impacts of utilities – a key concern of Industry and Agencies alike. By establishing utility corridors as a planning element in federal land use plans, public participation is encouraged in the review and consideration of future utility routes. Increased public awareness of this type of land use and the potential effects on public land can lead to constructive discussion of the need to designate corridors and rights of way on public land.

Yet another benefit of corridor designation is the expedition of the NEPA review process for granting rights of way. Designation may assist right of way applicants in identifying project alternatives or in satisfying some of the preliminary route/environmental review requirements.

The WUG acknowledges that Agency designation of the corridors does not bypass the NEPA process, nor does corridor designation guarantee an entitlement to use of such corridors. The WUG does however, regard the formal designation of the corridors identified in this study as critical to the long-term maintenance of efficient and reliable energy and telecommunication systems in the West.

CHAPTER 3
THE IMPORTANCE OF THE WESTERN REGIONAL CORRIDOR STUDY

WHY AN UPDATED CORRIDOR STUDY IS NEEDED

By 1990, it was apparent to the Western Utility Group that an update of the 1986 *Western Regional Corridor Study* was needed. There were many factors influencing this assessment: shifting demographics, advances in technology (such as the increased use of fiber optics), new construction designs and techniques, as well as environmental mitigation activities had changed the nature of facility planning and construction. The loss of numerous corridor opportunities due to federal legislation, restrictive land use regulations and public land management prescriptions was also requiring a greater industry focus on multi-use corridors and the associated facility compatibility issues. An up-to-date *Western Regional Corridor Study* would serve as an effective catalyst for a timely review of the industry's existing and anticipated utility corridor needs.

Many BLM Resource Management Plans were already either in the review process or were scheduled for review in the near future, and the Forest Service was beginning its second round of Forest Plans. The updated *Corridor Study* would provide a much needed regional reference for the BLM and Forest Service in support of their land planning and management efforts.

An up-to-date *Western Regional Corridor Study* would provide a much needed regional reference for the BLM and Forest Service in support of their land planning and management efforts.

From the earliest discussions on the need for a new *Study*, it was apparent that the updated *Corridor Study* would require a more comprehensive approach than the previous versions. In 1980 and 1986, the *Corridor Study* was prepared primarily by industry participants with little, to no, involvement of the federal land management agencies. While the information provided in those documents was useful to the Agencies in preparing their land use plans, both studies had certain limitations, primarily the lack of context for the identified existing and proposed corridors. There was insufficient mapped information to help the reader understand "why" corridors were located as shown on the *Study* maps.

While there are a number of factors that contribute to the location of a corridor – such as origination and destination points, economic considerations and engineering requirements – a key ingredient in the location of a corridor is the environmental and conservation requirements typically prescribed in land management plans, which can affect the construction of

utility facilities. Lacking this information, or specific knowledge of the adjacent and regional land use and environmental constraints, it was often difficult for an individual, or segments of the public, to understand the reasons for a specific corridor location.

The WUG also believed that it would be valuable to industry facility planners to know the location of constraint areas that exclude or restrict the location of linear facilities. This information would be particularly important given the loss of many potential utility corridors since the 1986 *Corridor Study*. Thus, the evolution of a new *Western Regional Corridor Study*.

THE GOAL OF THE WESTERN REGIONAL CORRIDOR STUDY

The primary goal of the *Corridor Study* is to focus increased Agency attention on the utility industry's future corridor needs. This document graphically illustrates these needs, as well as existing corridors, and the land uses that constrain or prohibit the construction, operation and maintenance of linear utility facilities. The ultimate objective of the *Corridor Study* is the incorporation of this regional corridor network into federal land management plans such that corridors will be protected for the public's future infrastructure requirements.

The ultimate objective of the *Corridor Study* is the incorporation of this regional corridor network into federal land management plans such that corridors will be protected for the public's future infrastructure requirements.

AGENCY BENEFITS

A number of benefits to federal land planning agencies can be expected from this *Study*. First, the updated mapping of existing and industry-proposed corridors and Agency Designated Corridors across the eleven western states will support the regional corridor planning activities of both the BLM and the Forest Service as Land Management Plans and Forest Plans are revised. As a map compendium of those areas that either restrict or prohibit the location of linear facilities across the West, the *Corridor Study* also effectively communicates the cumulative effects of land use policy and restrictions on industry corridor planning. Possibly most importantly, as a regional planning tool, the *Corridor Study* has the potential to facilitate interagency and interjurisdictional corridor planning and project review.

INDUSTRY BENEFITS

For the first time, a regional context has been developed that has the potential to foster efficient linear facility planning among the electric and gas utility, pipeline and telecommunication industries, as well as expedite project review by the BLM and Forest Service. The corridors identified in this document will be among those corridors most likely to be incorporated into federal land management plans. To the extent that these corridors become designated corridors in the land

management plans and to the extent that industry facility planners utilize these corridors, the time and costs associated with project siting, environmental review and permitting can be reduced. This document also provides industry corridor planners with a single reference that illustrates protected land uses across the West that constrain or prohibit the location of new facilities.

Perhaps the *Western Regional Corridor Study*'s value to Industry is best expressed in the following two Agency perspectives:

"Proponents of new projects would be well-advised to use the Western Regional Corridor Study during the development of their project alternatives, particularly until forest plans have been amended. The corridors presented in the Corridor Study are being given high consideration for incorporation into the Forest Plans. Project alternatives consistent with the Corridor Study will benefit from the screening process that has led to the identification of those corridors presented in the Corridor Study."

Ben Wallingford, Group Leader Rights-of-Way and
Non-recreation Special Uses, Rocky Mountain Region,
US Forest Service, Rocky Mountain Region, December 1991

"Industry should be aware that not only is the Western Regional Corridor Study an excellent source of information on current avoidance and exclusion areas, the BLM Right of Way and Realty staff uses the Corridor Study as a primary source of information on corridors during the Bureau's land use planning process as specified in the Bureau's Manual 1623.53 – Data Sources for Information on Rights of Way. In evaluating proposed projects, we look at the proponent's use of appropriate information resources during the conceptual stage of project development. The Corridor Study is one such resource."

Eric Stone, Program Analyst, US Bureau of Land Management,
Oregon State Office, December 1991

The corridors identified in this document will be among those corridors most likely to be incorporated into federal land management plans.

Most importantly, the *Western Regional Corridor Study* will help foster communication and cooperation in land planning between industry, the federal land management agencies and legislators, such that America's public lands can be efficiently managed and the energy and communication requirements of its citizens can also be met in the most efficient, environmentally sound and economical manner possible.

CHAPTER 4
STUDY METHODOLOGY

FORMATION OF THE STUDY TEAM

It was apparent from the outset of the *Study* that the desired end product would require extensive involvement of Industry, the BLM and the Forest Service. In fact, the comprehensive approach to the *Study* eventually involved an unprecedented number of participants (over 60 utility companies and over 280 jurisdictions of the BLM and Forest Service). Given the intensive level of participation required from a wide range of disciplines, across a broad geographic area, an organizational infrastructure was needed that could efficiently manage an extensive amount of technical information and effectively coordinate the various activities of Industry, the BLM and the Forest Service (from Washington, D.C., as well as local, state and regional offices across the West).

The WUG selected five of its representatives to form an Oversight Committee for the project. The responsibility of the Oversight Committee was to act as the *Study* decision-making body on behalf of the entire WUG membership. One member of the Oversight Committee was appointed as Project Manager. The WUG Project Manager served as liaison to the BLM and Forest Service, and spokesperson for the *Study* on behalf of the WUG; managed project funding activities; coordinated with the Project Consultant; and kept the Oversight Committee and WUG membership apprised of the *Study's* progress. Individual WUG members also volunteered to act as State Coordinators for the eleven western states. The State Coordinator's responsibility was to collect corridor information for their state, following the guidelines developed by the Project Consultant. It was the Project Consultant's responsibility to develop and implement the *Study* work plans and schedules; direct the activities of the State Coordinators; work directly with the BLM and Forest Service in collecting the constraint information; compile and map all corridor and constraint information; coordinate the technical workshops; prepare *Study* promotional materials and prepare the final report (the diagram on the following page illustrates the *Study* team organization).

The comprehensive approach to the Study involved an unprecedented number of participants-over 60 utility companies and over 280 jurisdictions of the BLM and Forest Service.

FACILITATING AGENCY PARTICIPATION

With the team organization and *Study* methodology in place, the focus shifted toward facilitating BLM and Forest Service participation. It was clear that effective Agency participation would require the endorsement of top BLM and Forest Service officials on the merits of the *Study*. Due to the early project

Western Regional Corridor Study Project Coordination

U.S. BUREAU OF LAND MANAGEMENT
James Colby
Washington, D.C.
Bill Weigand
Washington, D.C.
Ed Hastey
California State Director

WESTERN UTILITY GROUP OVERSIGHT COMMITTEE
Jack Steck
Public Service Co. of Colorado
Dennis Montoya
Southern California Gas Co.
Don Smith
US WEST
Don Hirschenhofer
MCI Telecommunications Corp.

U.S. FOREST SERVICE
Berwyn Brown
Washington, D.C.
J. Kenneth Myers
Washington, D.C.

WESTERN UTILITY GROUP PROJECT MANAGER
Carl Barnett
Sierra Pacific Power Co.

MICHAEL CLAYTON & ASSOCIATES PROJECT CONSULTANT
Michael Clayton

ARIZONA
Don Smith, US WEST, *State Coordinator*
Beau McClure, *BLM Contact*
Doug Salyer, *Forest Service Contact*

NEVADA
Carl Barnett, Sierra Pacific Power Co., *State Coordinator*
Jack Seley, *BLM Contact*
Frank Elder, *Forest Service Contact*

CALIFORNIA NORTH
Bob Groh, Pacific Gas & Electric Co., *State Coordinator*
Robert Barney, *BLM Contact*
Ronald Hanson, *Forest Service Contact*

NEW MEXICO
Don Smith, US WEST, *State Coordinator*
Teodoro Rael, *BLM Contact*
Doug Salyer, *Forest Service Contact*

CALIFORNIA SOUTH
Fred Owings, Southern Calif. Edison Co., *State Coordinator*
Robert Barney, *BLM Contact*
Ronald Hanson, *Forest Service Contact*

OREGON
John Hooson, Bonneville Power Co., *State Coordinator*
Eric Stone, *BLM Contact*
Lisa Freedman, *Forest Service Contact*

COLORADO
Dave Howard, Public Service Co. of Colorado, *State Coordinator*
Gary McVicker, *BLM Contact*
Ben Wallingford, *Forest Service Contact*

UTAH
Bruce Jensen, Utah Power & Light Co., *State Coordinator*
Steve Howard, *BLM Contact*
Frank Elder, *Forest Service Contact*

IDAHO
Dave Meyers, Idaho Power Co., *State Coordinator*
Butch Peugh, *BLM Contact*
Kent Nelson, *Forest Service Contact*

WASHINGTON
Gerry Prior, Puget Sound Power & Light Co., *State Coordinator*
Eric Stone, *BLM Contact*
Lisa Freedman, *Forest Service Contact*

MONTANA
Pat Reardon, Montana Power Co., *State Coordinator*
Jim Binando, *BLM Contact*
Kent Nelson, *Forest Service Contact*

WYOMING
Dale Raugutt, Pacific Power & Light Co., *State Coordinator*
Mel Schlagel, *BLM Contact*
Ben Wallingford, *Forest Service Contact*

coordination efforts of Industry representatives, and BLM and Forest Service personnel, an unprecedented joint memorandum, signed by the Director of the Bureau of Land Management, Cy Jamison, and the Chief of the Forest Service, F. Dale Robertson, offered the necessary support and cooperation of the BLM and Forest Service (see Appendix A for the complete text of the Memorandum). Not only were the Agencies' headquarters offices supportive of the *Study*, this spirit of cooperation was in evidence throughout the local, state and regional jurisdictions of the BLM and Forest Service throughout the eleven western states.

An unprecedented joint memorandum, signed by the Director of the Bureau of Land Management, Cy Jamison, and the Chief of the US Forest Service, Dale Robertson, offered the necessary support and cooperation of the BLM and Forest Service.

Under this endorsement and with the assistance of the Washington, D.C. offices, an Agency Oversight Committee was established and a representative from each state office of the BLM and each regional office of the Forest Service was selected to coordinate Agency participation in the *Study*. It should be noted that the federal government participation in the *Western Regional Corridor Study* was informal and this final report is not a government-sponsored document. While the *Corridor Study* is an extremely valuable planning tool, it is not a "decision-making document" that obligates either the BLM or the Forest Service to designate corridors as shown in the *Study*. Nor is Industry strictly limited to the corridors identified in the *Study* if a more appropriate route is identified on a project-specific basis.

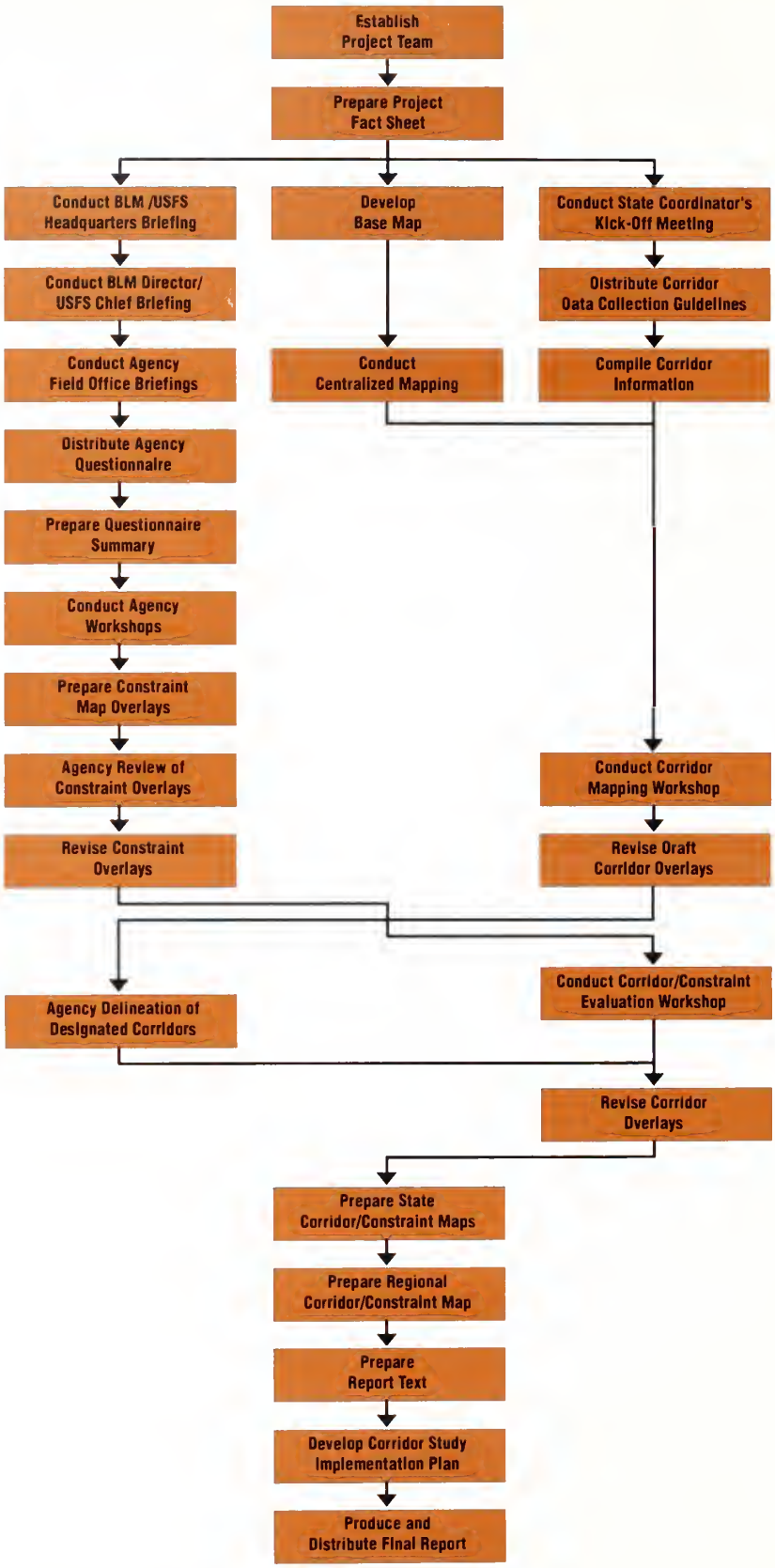
With the essential Agency contacts identified, the *Study* team was ready to embark on the myriad of challenging steps leading, some three years later, to the *Western Regional Corridor Study*.

THE "PARALLEL TRACK" APPROACH

An important and necessary facet to the development of the *Western Regional Corridor Study* process has been flexibility. As the *Study* progressed it also evolved. While the *Study* methodology generally consisted of a number of specific task-oriented activities, the dynamic and complex nature of the project required continuous modification of the process and intended products.

The approach diagram on the following page illustrates the general relationships between the numerous task activities leading to the product goal of a comprehensive corridor/constraint map for each of the eleven western states, as well as a composite regional map of the contiguous states. This diagram also illustrates the concurrent, or "parallel track" nature of the *Study*. While one track focussed on identifying, compiling and mapping corridor constraint information in consultation with the BLM and Forest Service, another, concurrent track, involved the close coordination of Industry participants and State Coordinators to identify, compile and map existing and proposed corridors.

Western Regional Corridor Study Process



COMPILING CORRIDOR INFORMATION

Much of the corridor information was compiled by Industry State Coordinators in accordance with guidelines prepared by the Project Consultant. In compiling this information, the State Coordinators contacted utilities and other companies that maintained or were planning for linear facilities within that state (the table below identifies the companies and organizations that contributed corridor information). Base maps were distributed to these companies for recordation of their existing and proposed corridors for electric and gas, pipeline and telecommunication facilities. Information from companies serving multiple states was compiled directly by the Project Consultant. The corridor information from all participating companies was compiled, evaluated and mapped, and a composite corridor map was developed for each state (Chapter 8 identifies the contributors of corridor information by state).

Industry Participants

Western Utility Group:
- Arizona Public Service Company
- AT&T
- Bonneville Power Administration
- Edison Electric Institute
- Idaho Power Company
- MCI Telecommunications Corporation
- Montana Power Company
- Nevada Power Company
- Northwest Pipeline Corp.
- Pacific Bell Company
- Pacific Gas & Electric Company
- Pacific Gas Transmission Company
- Pacific Power & Light Company
- Public Service Company of Colorado
- Public Service Company of New Mexico
- Puget Sound Power & Light Company
- Salt River Project
- San Diego Gas & Electric Company
- Sierra Pacific Power Company
- Southern California Gas Company
- US WEST Communications
- Utah Power & Light Company
- Washington Water Power

Amoco Pipeline
BC Hydro
Chevron Pipeline Company
Colorado Interstate Gas Company
Colorado Springs Utilities
Conoco
Coors Energy Company
C.P. National Corporation
Deseret Generation & Transmission Company
El Paso Electric Company
El Paso Natural Gas Company
Los Angeles Department of Water and Power
Olympic Pipeline Company
Overton Power District
Portland General Electric Company
Powerex
Questar Pipeline Company
Rocky Mountain Natural Gas Company
Santa Fe Pacific Pipeline Company
Seattle City Light
Shell Pipeline Company
Snohomish Public Utility District
Southern California Edison Company
Southwest Gas Corporation
Trans Alta Utilities Corporation
Tri State Generation & Transmission Assoc.
Tucson Electric Power Company
US Sprint
Western Area Power Administration
Western Gas Supply Company
Westpac
Westplains Energy

WORKING WITH THE AGENCIES

Concurrent with the collection of Industry corridor information was the initiation of numerous BLM and Forest Service consultations, the purpose of which was to answer the question: "What should the final report contain in order to be of most use to the federal land management agencies in their planning activities?" To address this issue, an Agency questionnaire was developed for distribution throughout the BLM and Forest Service. This information-gathering tool served to solicit comments on specific corridor planning issues, identify the status of Agency land and forest planning efforts and obtain recommendations for the content of the *Western Regional Corridor Study* Final Report (Appendix B provides a summary of the Agency responses).

Several Corridor Mapping Workshops were provided for in the *Study's* work program to address inconsistencies in the corridor and constraint data. During the first series of workshops, over 800 points of clarification were resolved!

The questionnaire results, combined with subsequent Agency consultations and information were compiled and evaluated, and the necessary corridor constraint data categories were selected. Constraint data for 10 federal and state land use types were collected, verified and mapped. Sources of constraint information included federal, state and local published maps, management plans and inventories, as well as unpublished data when more current information was needed. In some cases, errors were found in the published maps and this information has been corrected on the *Study* maps. Once the constraint mapping was completed, the maps were sent back out to the BLM and Forest Service to check the mapped data and verify jurisdictional boundaries. Chapter 8 identifies, by state, the BLM and Forest Service jurisdictions that contributed land information to the *Study*.

QUALITY CONTROL...QUALITY CONTROL...QUALITY CONTROL

As the maps evolved, a number of inconsistencies were identified in the information sources and mapped information. Constraint area boundaries often varied from source to source. Corridor inconsistencies included mis-alignment of corridors crossing state borders, different sources indicating different locations for the same corridor and non-interconnecting corridors within states and at state borders, to name but a few. However, based on the Project Consultant's experience with the 1986 *Study*, and given the large number of resources for corridor/constraint information, this circumstance had been anticipated. To address these inconsistencies, several Corridor Mapping Workshops were provided for in the *Study's* work program. These workshops were attended by State Coordinators, technical specialists, Agency representatives and the Project Consultant. During the first series of workshops, over 800 points of clarification were resolved!

Once all outstanding corridor questions and revisions had been resolved, each state corridor map was sent to the appropriate BLM and Forest Service office to indicate "Designated Corridors" as identified in their land management and forest plans. The revised corridor network (including the Agency Designated Corridors) was then composited with the constraint data to identify potential conflicts between proposed corridors and land use constraints. Of particular interest were those areas where a proposed corridor crossed an identified constraint. In many cases the corridor had been originally mapped without the benefit of the constraint information and was subsequently adjusted to avoid the constraint area. It was also at this point that different understandings emerged as to which corridors were actually Designated in Agency land use plans. Another series of extensive workshops resulted in the resolution of yet another 500 points of clarification.

As the *Study* entered its final phase, the intensive quality control effort continued. Following the adjustment of the individual State Maps, composite corridor/constraint maps were sent to the individual State Coordinators for a final review and any necessary corrections were made. The mapped constraint areas were then cross-checked with the constraint inventories provided in the text and each mylar overlay was given a final quality control check and cleaning prior to printing. The final State Map artwork was then used to develop the Regional Map.

The revised corridor network (including the Agency Designated Corridors) was composited with the constraint data to identify potential conflicts between proposed corridors and land use constraints.

CHAPTER 5
WESTERN REGIONAL CORRIDOR STUDY PROPOSED IMPLEMENTATION PLAN

STUDY IMPLEMENTATION

Throughout the latter stage of the *Western Regional Corridor Study*, meetings were held between utility Industry planners and BLM and Forest Service Agency representatives to develop an Implementation Plan for the *Corridor Study*. The Implementation Plan presented here identifies the specific actions that the BLM, Forest Service and Utility Industry will take to ensure that the *Study* is utilized to its fullest potential in the Agencies' respective planning processes.

The implementation Program details the necessary post-study actions of industry, the BLM, and Forest Service.

BLM DIRECTOR/FOREST SERVICE CHIEF

1. **Issue Implementation Plan memorandum**

   Issue a joint memorandum, signed by the Director and the Chief to be inserted in each copy of the *Western Regional Corridor Study*. This memorandum, prepared by the federal land management agencies, expresses the support of top management for the *Western Regional Corridor Study*. In addition, the memorandum would express the Bureau of Land Management and Forest Service view of what the *Western Regional Corridor Study* is, including its limitations. This memorandum is the federal land manager's opportunity to explain that the *Western Regional Corridor Study* is not a decision document but a planning tool.

2. **Modify agency direction to reference the *Western Regional Corridor Study* as appropriate.**

   Both agencies will review their respective planning and management guides and modify them to reference the *Western Regional Corridor Study* as appropriate.

3. **Take into account when reviewing proposed legislation, regulations and land management decisions.**

   Use the *Western Regional Corridor Study* as a reference document to review the effects of proposed legislation, regulations or land use decisions on existing and proposed major linear utility corridors.

4. **Facilitate resolution of identified interstate inconsistencies.**

   The *Western Regional Corridor Study* focuses on the regional concept of utility corridors. As planning efforts and corridor designation efforts proceed it may be necessary to address the resolution of interstate or interregional

inconsistencies in corridor designation. Due to jurisdictional boundaries the process in designating corridors in resource management plans or forest plans may become fragmented. This could result in the loss of continuity for a strategic corridor. Should this happen and resolution of the problem can not take place at the state level or the regional level, then the Director and/or the Chief will resolve the problem accordingly.

5. **Promote cooperation/partnership of BLM/Forest Service and the utility industry.**
Take every opportunity to publicize the *Western Regional Corridor Study* and promote the cooperation/partnership between the federal land management agencies and the utility industry. Types of publicity would include presentations by the Western Utility Group at industry and agency sponsored training sessions, conferences and management team meetings as well as press releases as appropriate.

STATE DIRECTORS/REGIONAL FORESTERS

1. **Include issue at agency management team and planning meetings.**
Address the issue of utility corridors at agency management team and planning meetings and promote dialogue on utility corridor considerations in planning activities. This will provide the opportunity for dialogue relative to the regional aspects of corridor designation.

2. **Review guidance for planning and modify if appropriate.**
Both agencies will review guidance for planning to ensure utility corridors and the *Western Regional Corridor Study* are considered in land management planning processes.

3. **Resolve interstate and intrastate inconsistencies.**
Due to the regional nature of utility corridors, it is possible that inconsistencies can occur due to jurisdictional boundaries. Consequently, utility corridor planning in a specific forest or BLM district should consider the ramifications that the designation, or non-designation of a utility corridor would have on adjacent jurisdictions. BLM state directors and/or regional foresters will address this problem when it occurs and, with the assistance and support of the utility industry, resolve inconsistencies as appropriate.

4. **Promote cooperative partnership between BLM/USFS and utility industry.**
Identify opportunities for publicizing the *Western Regional Corridor Study* and utilize whenever possible. Make training opportunities, supported by the utility industry, available to BLM and Forest Service field personnel whenever possible.

5. **(BLM) Designate existing corridors where appropriate.**
Section 503 of the Federal Land Policy Management Act (FLPMA) of 1976 provides for the designation of existing utility routes as utility corridors without further review. Existing utility line routes that are considered strategic corridors and are not controversial in nature should be designated as such in Bureau of Land Management resource plans wherever possible. This would save the delay and cost associated with having these non controversial routes designated through the planning process. This designation should be completed on a regional basis wherever possible.

DISTRICT MANAGERS/AREA MANAGERS/FOREST SUPERVISORS/DISTRICT RANGERS

1. **Review existing land use plans in relation to the *Western Regional Corridor Study* and ongoing needs and identify needed changes.**
Review existing land use plans to determine if utility corridors have been addressed therein. Insufficiencies need to be identified and action plans developed.

2. **(BLM) Review the *Western Regional Corridor Study* and determine if any existing Rights of Way should be designated corridors now, as provided for in Section 503 of FLPMA. Recommend designations to BLM State Director.**
Review existing strategic utility routes to determine if they can be designated as utility corridors under Section 503 of FLPMA.

3. **Promote cooperative partnership between BLM/Forest Service and utility industry.**
Inform staffs and the public as to the need to better understand the importance of utility corridors. In addition, provide opportunities for training, with the support of the utility industry.

4. **Consult *Western Regional Corridor Study*, forest plans and/or resource management plans when reviewing major interstate and intrastate linear utility projects.**
Provide direction to field staffs to consult the *Western Regional Corridor Study* in relation to existing plan documents when reviewing major interstate and intrastate linear utility projects to determine if the utilization of an existing utility corridor is the best routing opportunity.

UTILITY INDUSTRY

1. **Maintain liaison efforts with BLM and Forest Service to insure ongoing focus on corridor needs.**
The utility industry, through the Western Utility Group will maintain a liaison with both federal land management agencies to insure that contacts are continued. Both agencies will be provided with contacts to insure that the

utility industry will support and assist in utility corridor designation in federal land planning activities.

2. **Participate in BLM and Forest Service planning efforts.**
   The utility industry will support and participate in federal land planning efforts. The Western Utility Group will provide both the Bureau of Land Management and the Forest Service with area contacts to insure this interaction.

3. **Promote and support cooperative partnership between BLM, Forest Service and Utility Industry wherever possible.**
   The utility industry, through the Western Utility Group will assist the Bureau of Land Management and the Forest Service wherever possible to promote and support cooperative partnerships. Special emphasis will be placed on the cooperation and assistance that the Western Utility Group has received in developing the *Western Regional Corridor Study*.

4. **Actively promote and support the implementation of utility corridors in federal land planning efforts.**
   The utility industry, through the Western Utility Group will use the *Western Regional Corridor Study* as the basis for actively promoting consideration of utility corridors in federal land planning efforts.. This will include active participation in scoping meetings and workshops to determine locations of strategic utility routes.

5. **Inform other land management agencies of the availability and intended use of the *Western Regional Corridor Study*.**
   The utility industry, through the Western Utility Group will continue its efforts to focus on the importance of protecting strategic utility corridor routes by working with other federal state and local land management agencies wherever needed. Other agencies to be contacted include the National Park Service, the U. S. Fish and Wildlife Service, the Bureau of Indian Affairs, the Bureau of Reclamation, state land management agencies and county/city planning commissions. It is understood that the *Western Regional Corridor Study* is only the first phase of a comprehensive interaction between the utility industry and all land planning agencies.

CHAPTER 6
FACILITY COMPATIBILITY WITHIN CORRIDORS

A primary reason for locating utility facilities in joint use corridors is to reduce the proliferation of rights of way and the associated environmental impacts on federally managed lands. Secondarily, the steady increase in land usage and regulatory constraints is resulting in fewer available facility routes and therefore, fewer opportunities for facility location. In fact, in the past decade, federal land management agencies have increasingly required new utility facilities to be placed within established corridors. This emphasis on joint use of corridors mandates a reassessment of the needs and issues associated with utility rights of way, particularly concerning multiple facility compatibility within a corridor.

The intent of this chapter is to address general compatibility concerns that need to be considered when planning or evaluating joint use of utility corridors, not to provide specific facility siting standards.

Utility companies and federal land management agencies have identified a number of compatibility issues relevant to locating multiple facilities within a corridor. These issues include service reliability; construction access and procedures; maintenance access and procedures; minimum separation requirements between facilities; worker and public safety and industry-specific issues such as induced voltage, cathodic protection and fiber optic cabling. The following sections address the primary issues associated with each of the major utility corridor users: electric transmission lines, pipelines and telecommunications lines.

Utility companies and federal land management agencies have identified a number of compatibility issues relevant to locating multiple facilities within a corridor, including: service reliability, construction and maintenance access procedures, and minimum separation requirements.

ELECTRIC TRANSMISSION LINES

SERVICE RELIABILITY

A primary issue associated with the joint use of corridors is the electric utility company's ability to deliver uninterrupted service to its customers upon demand. Service reliability of the electric supply system is dependent on well-maintained transmission lines that have to support instantaneous transfers of thousands of megawatts. Electric transmission is relatively immediate and even a short disruption can result in severe consequences to customers. Furthermore, unlike natural gas and oil products, no viable or efficient means of storing large amounts of electricity currently exists. Electricity must be produced, transmitted and distributed instantaneously to meet the energy needs of customers.

The high voltage electric transmission lines comprising the western regional network provide critical links between energy sources and load centers. Typically, electric transmission lines range in size from 50 kV to 800 kV. These lines, particularly at voltages of 230 kV and above, carry bulk power from electric generation plants to load centers, or between power systems. Lines comprising regional power transfer systems are called interties. A utility grid is formed by the combination of interties, transmission lines and distribution lines. Due to the nature of the Industry, transmission lines need to be designed and sited to minimize the potential for a simultaneous outage of several major system links. For an interconnected electric system, reliability becomes an issue when major electric transmission lines share a common right of way and are therefore subject to a higher probability of simultaneous failure. The simultaneous loss of major transmission lines (or interties) could cause overloads severe enough to initiate cascading outages. The excess power from one area would naturally flow to power-deficient areas, using any underlying or parallel paths. The result of the increased loading or overloading of these alternative lines could result in the uncontrolled breakup of the interconnected transmission system and could potentially cause interruption of service.

Power transfers between regions are large enough that simultaneous failure of major transmission links can have widespread consequences, including disrupted power supplies to customers in neighboring states. For example, high winds caused the loss of two adjacent 500 kV line towers on the Pacific Intertie and the resulting power outage left an estimated 5,230,000 customers in California, Nevada, Oregon and Texas without power.

The risk of simultaneous power outages can be reduced if adequate separation between facilities is provided.

Parallel transmission lines present an issue of concern in that a simultaneous power outage could occur as a result of an airplane collision, severe ice and wind storms, lightning or forest fires. When forest fires occur in the general proximity of major lines, smoke and ash residues may be deposited on the insulators and cause an electric flashover from the conductor to the metal tower. A flashover can occur if the conductor's electric current travels through the layer of residue or dust on the insulator and then through the metal tower, creating a ground fault current. The risk of simultaneous power outages can be reduced if adequate separation between facilities is provided. In addition, the risk of power outages due to airplane collision can be reduced by assuring that minimal separation between lines is maintained. In areas of heavy vegetation where the possibility of forest fires is increased, several miles should separate regional intertie lines.

SEPARATION REQUIREMENTS

Separation requirements are based primarily on access, safety and operational considerations. Most of the facility compatibility issues can be avoided or resolved through adequate facility separation. The minimum desired separation required between facilities depends on corporate policy, the type of facility, vegetative cover and the terrain being traversed.

Industry-wide studies have found that the risk of simultaneous outages dramatically increases in proportion to decreases in transmission line proximity. In order to minimize this risk to an acceptable level in areas of heavy vegetation (such as forest lands) it is recommended that facility separation be measured in miles. In areas of sparse vegetation, in order to meet acceptable levels of risk, the recommended separation is 2,000 feet. Where these minimum separations are not possible (due to land use or physical constraints) the separation between transmission lines can be reduced for a limited distance.

The right of way width required for transmission lines is generally dictated by the tower and circuit configurations and the level of voltage carried.

The National Electric Safety Code (NESC) has established minimum separation distances. These distances are based strictly on minimum safety requirements. Typical single-circuit transmission lines should maintain separation distances varying from 80 feet (between two 138 kV lines – centerline to centerline) to 175 feet (between two 750 kV lines). The separation requirement for two double circuit, 500 kV lines is 200 feet.

SPACE REQUIREMENTS

The right of way width required for transmission lines is generally dictated by the tower and circuit configurations and the level of voltage carried. Factors also considered in calculating the right of way width include phase spacing, structure flashover clearance, conductor swing and the effects of electromagnetic or electrostatic induced currents on metallic structures located at the right of way edge.

As a result of varied Industry practices, a wide variation in right of way widths are found for different voltage levels. Typical transmission line construction and right of way widths established by the NESC, based on conductor swing, vary from 90 feet (for a 138 kV single circuit line) to 280 feet (for a 750 kV double circuit line). When two parallel, single circuit facilities are proposed for the same right of way, the width requirements vary from 170 feet (for two 138 kV lines) to 355 feet (for two 750 kV lines). Two 500 kV, double circuit lines would require a 410-foot wide right of way. The right of way needed for construction is generally much less than the voltage-based right of way requirements above, however, additional right of way may be needed at angle points to accommodate structural guying.

ACCESS REQUIREMENTS

Adequate access is often a concern when the single or joint use of a corridor is being considered. During facility construction, access along the right of way is necessary for workers, heavy equipment and materials. Access roads to every tower site are desired, however, where construction of access roads is impractical, helicopters can be used. In addition, ingress and egress routes into the right of way for construction vehicles and equipment are needed.

Upon completion of the construction phase, continued use of access roads along the right of way is necessary to inspect and maintain the facility. While the frequency of inspection and maintenance varies, in general, most companies require year-around facility access. Access road maintenance requirements are usually addressed in road maintenance agreements between the parties using the corridor. These agreements typically specify the road maintenance requirements, the party responsible for meeting specific requirements and the appropriate compensation for road maintenance activities.

Induced current becomes a compatibility concern when electric transmission lines are to be located near metal pipelines and communication cables containing metal components.

INDUCED CURRENT

Induced current is the primary safety concern associated with electric transmission lines. During construction and maintenance of utility facilities located under, or in close proximity to, a high voltage electric transmission line, proper grounding procedures are required to avoid potential hazardous electric shock to workers. When working in close proximity to de-energized lines, the existing line is grounded in case the line is accidentally energized.

Induced current becomes a compatibility concern when electric transmission lines are to be located near metal pipelines and communication cables containing metal components. Metal components may act as conductors and can acquire an electrical potential from an electric transmission line, causing an electric current along the pipeline or cable. Such currents can cause corrosion of a pipeline, disruption of transmission in telecommunications cables and could deliver a shock to a person upon contact. To minimize shock hazard and corrosion potential, metal structures in close proximity to electric transmission lines must contain devices such as grounding rods, shielding and corrosion protection systems to prevent the conduction of induced currents along the facility.

In addition, high voltage AC power lines produce electric fields around the conductors carrying electricity. The higher the voltage, the stronger the electric field. These electric fields can cause ungrounded metal

objects (such as wire fences with dry wood posts, large vehicles with rubber tires and metal pipelines) to develop an electric charge by electrostatic coupling. If the metal object is not adequately grounded, current can flow through the object and human contact with that object could cause a shock. Electric charges may also be induced in metal objects near a transmission line as a result of transient discharges and ground fault currents.

Typically, the magnitude of the electrostatic current induced on ungrounded metal objects located within the field of a high voltage transmission line depends on the electric field level, the surface area of the object and the distance of the metal surface from the transmission line conductor. The magnitude of the current experienced by a person touching the object would depend on the electric field level, the size and shape of the object, the degree to which the electric field is interrupted by features such as vegetation and buildings and the impedance of the current's path through the person to the ground.

FAULT CURRENT

When the current being transported by a high voltage transmission line flows into the ground, fault current is produced. Causes of fault currents include lightning contact with transmission line towers, broken energized conductors coming in contact with the ground and flashover from conductors to towers due to dust or ash accumulation on insulators. Depending on its magnitude, a fault current can cause damage to metal structures, puncture the coating of an underground pipeline (or even the pipeline itself if sufficient heat is generated) and can travel along the pipeline.

A fault current can cause damage to metal structures, puncture the coating of an underground pipeline or even the pipeline itself if sufficient heat is generated.

When a transmission line is located next to a pipeline (see Section 6.2 Pipelines), several measures may be necessary to protect the pipeline from fault current. These measures include designing thicker coatings for the sections of pipe near tower footings, installing counter poised systems, or placing sacrificial anodes (or ground shields) underneath the towers. Counter poised systems consist of long cable installations designed to reduce ground current. The effectiveness of such a system depends on the area's ground resistance (earth resistivity). The ground resistance must be low for counter poised systems to work effectively. Sacrificial anodes consist of metal (e.g., zinc or magnesium), that receive the fault current from the towers and prevent it from reaching other underground metal structures. Repeated ground faulting occurrences can corrode the anodes and thus, in order to be efficient, sacrificial anodes must be monitored periodically and replaced when necessary.

CONSTRUCTION DUST

When a new facility requiring substantial earth moving activities, such as an underground pipeline, is constructed in close proximity to an electric transmission line, dust suppression measures are very important. Dust can accumulate on the insulators and result in electric flashover and as discussed earlier, current can travel through the layer of dust on the insulator and through the metal tower creating a ground fault current.

PIPELINES

SERVICE RELIABILITY

Temporary interruptions of pipeline services are not linked as closely to service reliability as is the case for electric transmission systems, since the disruption of pipeline product transport can often be mitigated by maintaining storage tanks near service areas.

Unlike electricity which is essentially transported instantaneously, pipeline products (e.g., natural gas or oil products) are transported between two end points over a period of time. As a result, temporary disruption to pipeline systems may result in inconvenience or added costs, but generally are not catastrophic. Temporary interruptions of pipeline services are not linked as closely to service reliability as is the case for electric transmission systems, since the disruption of product transport can often be mitigated by maintaining storage tanks near service areas.

A primary concern regarding service reliability is that if one line ruptures and gas blow off occurs, nearby lines may be damaged. Sometimes, even when no damage is apparent, the integrity of nearby lines may be compromised and they must be shut down for inspection. Depending on the extent of the damage and the time required to repair it, the interruption of transmission may result in disruption to delivered services. To improve service reliability, major transmission pipelines (e.g., 30-inch diameter or greater) should not be constructed in close proximity to each other.

SEPARATION REQUIREMENTS

Pipeline separation requirements primarily address access, safety, technical and operational considerations. The minimum separation required between facilities typically depends on company policy. Based on Industry guidelines, standards and practices, separation between two 24-inch pipelines (centerline to centerline) would be 31 feet in normal soil and 50 feet in rocky soil. In the case of a 48-inch pipeline being built parallel to an existing pipeline of the same dimension, the separation requirement would be 40 feet in normal soil and 50 feet in rocky soil. These dimensions are typical of desired right of way widths and may vary in actual practice. In some instances, second lines have been installed with only a few feet separating the two pipes. Typically, this occurs in very constrained areas (e.g., severe topography) and only for short distances.

Vertical separation between facilities must also be maintained. The State of California Public Utility Commission's General Order 112-D requires at least 12 inches of clearance between a transmission pipeline and any other underground structure. When pipelines cross pipelines, the minimum vertical separation is not as critical as adequate insulation and support. Insulation must be designed to prevent electrical connection between the pipelines and potential interference between the corrosion protection systems. Support for the crossing must prevent overburdening on the lower pipeline.

Separation between a pipeline and an electric transmission line frequently depends on corporate policy and the voltage of the electric line.

SPACE REQUIREMENTS

For most pipeline facilities, right of way requirements are dictated by the initial space required for construction activities. Space is needed for construction access, operation of heavy equipment, trenching and temporary storage of excavated materials and pipeline segments.

The basic sequence of operations in the construction of a pipeline is clearing, grading, stringing, trenching, bending, line-up, welding, coating, placement, clean up and restoration. While these activities are being conducted, materials such as removed vegetation, excavated dirt and sections of pipe may be temporarily stored along one side of the right of way. The remaining area is used to dig the trench and provide access for construction equipment.

For most pipeline facilities, right of way requirements are dictated by the initial space required for construction activities.

The right of way width requirement for a single pipeline installation typically ranges from 50 to 100 feet, depending on pipe diameter and size of the necessary construction equipment. Additional area may be needed when the route alignment includes cut and fill, intersection with other systems, river crossings or other activities that generate the need for additional equipment and/or working area. After construction is completed, the right of way requirement could conceivably be reduced, since operation and maintenance activities would generally require 15 to 50 feet of right of way. Based on Industry guidelines, standards and practices, construction of a 24-inch pipeline parallel to an existing pipeline of the same diameter could require the right of way width to be 87 feet in normal soil and 106 feet in rocky soil (the greater dimensions in rocky soil result from the potential requirement for blasting). For both single or double line construction, ancillary equipment such as block valves, pumping stations and blowdown assemblies can normally be accommodated within the original construction right of way width.

BLM LIBRARY
SC-653, BLDG. 50
DENVER FEDERAL CENTER
P. O. BOX 25047
DENVER, CO 80225-0047

ACCESS REQUIREMENTS

Construction of a pipeline requires road access to the entire length of the right of way. To avoid the need for turnaround areas, ingress and egress routes for construction vehicles and equipment are generally required. Upon completion of the construction phase, year-round access along the right of way is necessary for maintenance and facility repair.

A potential conflict may occur if access roads proposed for use by heavy equipment cross over existing underground pipelines. In a joint use corridor, this could occur if a new facility is to be constructed near a pipeline and construction vehicles need to cross over the pipeline right of way. This could also occur for major maintenance or repair work. In order to avoid excessive overburden on underground pipelines, additional fill is often added to road segments over pipes to increase the buffer between the road surface and the pipeline facility. Steel reinforcement under the access road can also mitigate this impact. When a pipeline is constructed under an existing access road, mitigation measures include burying the pipe deeper or using either a heavier wall pipe or an encased pipe under the roadway.

The most common issue of concern associated with pipeline facilities, from both an Industry and environmental standpoint, is their potential for leaks or spills, which is of particular concern in the case of joint use corridors.

PIPELINE LEAKS

The most common issue of concern associated with pipeline facilities, from both an Industry and environmental standpoint, is their potential for leaks or spills, which is of particular concern in the case of joint use corridors. Leaks can occur if a pipeline is damaged by mechanical impact, seismic activity or corrosion. While impacts to the environment as a result of a leak are of critical concern, fire and explosion are among the other primary hazards associated with pipeline leaks. Toxicity may also be an issue if gaseous toxic substances, such as hydrogen sulphide, are released. In the case of gas leaks, fire can be started by natural causes such as lightning or sparks created by rocks falling due to earth movement, or by man-made structures or activities such as sparks generated by a nearby electric transmission line. Fire or explosion due to a ruptured pipeline can damage nearby facilities and interrupt services to customers. Release of toxic substances may also create a health hazard to the public and workers within the right of way. To reduce the potential for such accidents, electric utility companies try to minimize encroachment under their lines by pipelines proposed for the same corridor. Typically, pipeline companies coordinate with other utility companies within the corridor, to ensure that the pipeline cover material is not compromised during construction or maintenance activities, or by forces of nature or industrial accidents.

CORROSION/CATHODIC PROTECTION

When metal surfaces contact the ground, there is the potential for corrosion to occur due to moisture or corrosive currents from anodic (positively charged) areas crossed by the pipeline. Pipeline corrosion control typically includes the application of a protective coating to the pipe and a cathodic protection system applied to the entire pipeline. The coating (e.g., fusion bond epoxy) prevents water and corrosive soils from making direct contact with the pipe material.

To protect a pipeline from induced current, once the pipe is in place, the entire pipeline is protected with a cathodic protection system consisting of groundbeds and rectifiers. This system consists of applying cathodic (negatively charged) current from an external source to oppose the discharge of corrosive current from anodic (positively charged) soils traversed by the pipeline. Rectifiers are used to apply direct current electricity to the pipeline. In a properly installed cathodic protection system, all components of the protected structure collect current from the surrounding electrolyte (soil) and the entire surface becomes a single cathodic area. The extent and location of cathodic protection is usually determined by the type of soil crossed by the pipeline. During operation of the facility, the performance of the cathodic protection system is tested by corrosion protection test stations installed every few miles along the facility.

The installation of other pipeline or metallic structures in close proximity to an existing pipeline could interfere with the existing pipeline's cathodic protection.

Damage to the pipeline coating during construction or maintenance of adjacent facilities is often a concern expressed by corridor users. Damage to the coating may occur when constructing a foundation for an overhead facility, digging trenches or installing underground facilities across existing pipelines. As a safety measure, pipeline facilities often include a colored identification tape or fill in the trench and identification markers on the surface. To ensure line safety, pipeline companies often require that construction activities near their facilities be monitored by their personnel.

The installation of other pipeline or metallic structures in close proximity to an existing pipeline could interfere with the existing pipeline's cathodic protection. When this situation occurs, it is the responsibility of the owners of the new facility to mitigate any adverse affects that the new facility imposes on existing cathodic protection systems. An ineffective cathodic protection system for the new metallic structure can generate a "stray current", which may cause corrosion where the stray current leaves the structure. In order to avoid this risk of corrosion, the existing facilities must be bonded with the new facility. Bonding causes all metal surfaces from the interconnected structures to be protected from corrosion as a single cathodic area. By bonding the nearby

facility, potential stray currents leave the structure through the bonding cable and return to the originating system in a controlled manner. The U.S. Department of Transportation requires that pipelines be electrically isolated from other underground metallic structures, unless the pipeline and the other structures are electrically interconnected and cathodically protected as a single unit.

TELECOMMUNICATION LINES

SERVICE RELIABILITY

Of primary concern to the telecommunications Industry is service reliability. Loss of the only communication line serving a community could result in isolation. Such isolation of a community could potentially result in endangered life, particularly if failure of the communication line occurs as a consequence of failure of other utility systems in a joint use corridor and the community is not only isolated from communication but also deprived of electricity and natural gas services. If the out-of-service line is but a single facility to an area served by multiple facilities, localized disruptions of service would likely be only temporary. The simultaneous loss of more than one regional communication link connecting major service areas could result in the disruption or even interruption of service, if no regional alternative communication links exist or if the alternative lines are overloaded. Causes of interruption of communication service include physical damage to cables due to excavation within the right of way, major electronic equipment failure, contact with lightning at a regenerating station, forest fires (heat affects electronic equipment located above ground) or a power outage outlasting the communication system's backup battery power (approximately 8 hours).

The simultaneous loss of more than one regional communication link connecting major service areas could result in the disruption or even interruption of service.

Loss of primary communication lines could significantly affect a large number of customers and emergency rescue activities. To improve reliability and avoid service disruptions, most long distance and local exchange carriers try to have redundant systems (i.e., multiple lines) serving an area.

SEPARATION REQUIREMENTS

Industry guidelines, standards and practices dictate a minimum five foot separation requirement between communication lines and other underground facilities. In order to ensure service reliability, a few miles should separate communication lines providing redundant services to an area.

When located near high voltage electric transmission lines, coaxial communication cables can be affected by induced current which cause a degradation of the transmission signals. Adequate separation or shield-

ing of metallic cables is necessary to eliminate interference of the communication transmission. However, fiber optic cable is immune to induced currents and suffers no degradation of transmission due to proximity to electric transmission line. When either a coaxial or a fiber optic cable is installed at close proximity to electric transmission lines, worker safety is a concern. Adequate grounding and safety procedures or de-energizing of the line are required.

SPACE REQUIREMENTS

Similar to pipeline facilities, the space requirements for a telecommunication facility are dictated by the initial space required for construction activities. During construction of an underground telecommunication line, clearance is needed for excavation of a trench, operation of heavy equipment, temporary storage of materials and access for equipment and vehicles. The right of way width is established primarily by the size of equipment and the material involved in constructing the underground communication facility.

Based on Industry guidelines, standards and practices, the required right of way width to construct a buried communication line (waveguide or coaxial cable encased in pipe) would be a minimum of 30 feet. After construction, the operational width would be 15 feet. Additional real estate would be required for repeater and regeneration sites. If a fiber optic cable is installed on top of overhead transmission line, replacing the shield wire, no additional right of way width is necessary.

The right of way width for a telecommunication facility is established primarily by the size of equipment and the material involved in constructing the underground facility.

Similar to pipelines, underground communication lines crossed by access roads can also be damaged by heavy vehicle traffic. As with pipelines, additional fill is often added to increase the buffer between the road and the encasing pipe.

ACCESS REQUIREMENTS

Construction of underground communication lines would require road access to the entire right of way length. To avoid the need for turnaround areas, an ingress and an egress route for construction vehicles and equipment would be required. Upon completion of the construction phase, continued access along the right of way would be required for repair and maintenance purposes, on a year-round basis.

CORROSION ISSUES

Compatibility issues associated with multi-use corridors include the potential for corrosion of the communication facility's metallic components due to electrical currents from pipeline cathodic protection systems or from electric transmission facilities. Communication facilities located within two miles of a pipe-

line that is being protected by an impressed current cathodic system (system using rectifiers) may be subject to increased corrosion.

SAFETY OF UNDERGROUND FIBER OPTIC CABLES

Communication companies generally avoid sharing the right of way of an underground fiber optic cable facility with other companies, because of the potential for construction and maintenance activities to damage the fiber optic cables. Fiber optic cables have relative small diameters and provide efficient communication transmission. Accidental damage to a fiber optic cable can result in disruption of service to a large number of customers.

To ensure the safety of their lines, communication companies require that construction activities near their facilities be monitored by their personnel. Communication companies also discourage and monitor access to their rights of way to avoid damage to their facilities.

When equally considered, issues that are common to the major utility corridor users combined with facility-specific issues present a complex challenge to determining multiple facility compatibility within a single corridor.

In conclusion, many of these issues, such as service reliability, construction and maintenance access and worker and public safety are common to all types of facilities participating in joint use of a utility corridor. Other issues, such as induced voltage, cathodic protection and separation requirements, can be facility-specific, yet equal in importance. When equally considered, issues that are common to the major utility corridor users combined with facility-specific issues present a complex challenge to determining multiple facility compatibility within a single corridor.

PERSONS AND ORGANIZATIONS CONSULTED REGARDING FACILITY COMPATIBILITY

Amrhyn, Chuck	Bell Communications Corporation
Barbing, Bob	Bureau of Land Management, Colorado
Barnett, Carl	Sierra Pacific Power Company
Binando, Jim	Bureau of Land Management, Montana
Craig, Dave	Pacific Gas and Electric Company
DeVaney, Paul	Bell Communications Corporation
Groh, Bob	Pacific Gas and Electric Company
Halford, Tom	Los Angeles Department of Water and Power
Hawksworth, Rob	Northwest Pipeline Corporation
Hayes, Butch	Bureau of Land Management, Nevada
Holloway, Chuck	Los Angeles Department of Water and Power
Howard, Dave	Public Services Company of Colorado
Johnson, Steve	Bureau of Land Management, California
Lorenzini, Kevin	AT&T
Michels, Arwin	Public Service Company of Colorado
Montoya, Dennis	Southern California Gas Company
Nose, Ben	Southern California Gas Company
Reardon, Pat	Montana Power Company
Rich, Gary	Pacific Gas and Electric Company
Rodella, Tom	Pacific Gas and Electric Company
Schick, George	National Association of Corrosion Engineering
Smith, Don	US WEST Communications
Stone, Eric	Bureau of Land Management, Oregon and Washington
Tellefsen, Karen	Bell Communication Corporation
Vollbrecht, Gary	Pacific Gas and Electric Company
Wakefield, Lloyd	Pacific Gas and Electric Company

CHAPTER 7

CORRIDOR SITING CONSTRAINTS IN THE ELEVEN WESTERN STATES

ABOUT THE CONSTRAINTS

The Western United States is home to some of the nation's most valuable natural resources. In order to protect these resources, a myriad of local, state and federal laws and regulations have been enacted. Many of these laws and regulations prohibit or restrict development within these areas. Although not all legislative and regulatory restraints preclude the construction, operation and maintenance of linear utility facilities, they can increase the cost, difficulty and time associated with obtaining project approval and rights of way. For the purpose of siting utility corridors, legislatively protected areas have been identified as "constraint areas" and have been shown as such on the *Corridor Study* maps (a list of the constraint categories depicted is presented in the table below). In addition, other land uses (e.g., Indian Lands and Military Use Areas) that constrain the development of regional utility systems, are also depicted.

Although not all legislative and regulatory restraints preclude the construction, operation and maintenance of linear utility facilities, they can increase the cost, difficulty and time associated with obtaining project approval and rights of way.

Corridor Constraint Categories

Wilderness Area
Wilderness Study Area
Indian Land
National Park
National Conservation Area
National Wildlife Refuge
Wild & Scenic River
Military Use Area
Other Federal Land (Includes National Monuments, Recreation Areas, and Scenic Areas)
State Designated Land

There are several other types of resources that constrain the location of utility corridors, but were not mapped because: their designation or location is evolving (National Trails System); development within the land area is not necessarily precluded (Areas of Critical Environmental Concern – ACEC); or the land area is site-specific and too small to map due to the scale of the *Corridor Study* maps (ACEC's, cultural resources, sensitive biological habitats, areas of high visual sensitivity, and steep topography). These areas are more appropriately evaluated on a project specific basis.

Many constraint categories overlap or are under the jurisdiction of two or more governmental agencies. In such cases, the most restrictive areas were given precedence on the maps in terms of color identification and area classification. Using the Wyoming map as an example, Yosemite National Park contains wilderness within the park boundaries. This Wilderness Area (considered more restrictive to the siting of corridors than National Park areas) was given precedence in assigning color and classification on the map. In this specific case, most of the park is represented as wilderness while only the non-wilderness areas in close proximity to the roads are colored to represent National Park lands.

Many constraint categories overlap or are under the jurisdiction of two or more governmental agencies. In such cases, the most restrictive areas were given precedence on the maps in terms of color identification and area classification.

In a few cases, identical constraint categories are contiguously located but have different names or are managed differently. For the purposes of clarity on the *Corridor Study* maps, contiguous areas of the same constraint are shown as one area without boundaries.

Extreme care was used during the compilation of the constraint areas to ensure accuracy. It is important to note, however, that due to on-going changes in ownership, legislative designation and management directives, it is possible that a specific constraint area boundary or designation may change over time. The constraint categories most likely to experience change include: Wilderness Areas, Wilderness Study Areas, Wild and Scenic Rivers and Indian Lands.

CONSTRAINT AREAS

The remainder of this chapter describes each of the constraint categories that appear on the Corridor/Constraint Maps.

Wilderness Area

The passage of the Wilderness Act in 1964 gave Congress the responsibility of designating and protecting Wilderness Areas. These areas are protected and managed to preserve their natural conditions, which appear to have been affected primarily by the forces of nature. Wilderness Areas are typically over 5,000 acres in size, and may contain features of scientific, educational, scenic or historical value, as well as ecologic and geologic interest.

Wilderness Areas are among the most highly protected lands within the United States, and are administered by one of the following managing agencies: Bureau of Land Management, Forest Service, Fish and Wildlife Service, or National Park Service.

Activities allowed within Wilderness Areas include: mining, grazing, water resource development, hunting, fishing, hiking and camping. The construction of temporary or permanent roads and structures; use of motor vehicles, motorized equipment or motorboats; landing of aircraft or use of any other form of mechanical transport are prohibited in wilderness areas. Except for existing private rights, the Wilderness Act does not allow commercial enterprise. Wilderness Areas are managed per the restrictions described above regardless of the Agency jurisdiction under which the specific area falls.

Wilderness Study Area

With the passage of the Federal Land Policy and Management Act (FLPMA) in 1976, the Bureau of Land Management, Forest Service, Fish and Wildlife Service, and National Park Service became responsible for reviewing lands within their jurisdictions to identify areas suitable for designation as Wilderness Areas. These agencies report their findings to the President, who in turn is responsible for submitting Wilderness Area designation recommendations to Congress.

Different nomenclature (e.g. RARE II and Instant Study Area) has been used by different agencies at different points in time to represent these potential Wilderness Areas. The most common name (and the one that is used in the *Corridor Study*) is the BLM terminology – Wilderness Study Area. The BLM, Forest Service and National Park Service are responsible for protecting the wilderness characteristics and values of the identified study areas until Congress either designates the area as Wilderness or releases it for other uses. Therefore, for all practical purposes, Wilderness Study Areas are managed as Wilderness Areas.

For all practical purposes, Wilderness Study Areas are managed as Wilderness Areas until Congress either designates the area as Wilderness or releases it for other uses.

For the purposes of the *Corridor Study*, the Wilderness Study Areas identified on the Corridor/Constraint maps include areas administered by the BLM and National Park Service, Congressionally designated Wilderness Study Areas administered by the Forest Service, and areas administratively endorsed as suitable (prior to May 1983) administered by the National Park Service.

Indian Land

Indian lands within the United States including Reservations and Rancherias fall under the jurisdiction of the U.S. Department of the Interior, Bureau of Indian Affairs. In February of 1948, Congress authorized the Secretary of the Interior to grant rights of way for all purposes across both tribal and individually owned Indian land.

Although utility rights of way can be granted across Indian Lands, the risks, difficulties and costs that are incurred by utility companies in trying to obtain (and renew) these rights of way, are such that they are considered a constraint, and are avoided whenever possible.

The Indian Lands shown in the *Western Regional Corridor Study* were mapped from a number of sources. When location and boundary discrepancies appeared in the information from published sources, either the U.S. Bureau of Indian Affairs' District Field Office staff or individual tribal leaders were contacted for verification of current boundary lines to assure the most accurate depiction of Indian land. It should be noted that Reservation boundaries are currently being challenged in many states.

National Park

The first national park, Yellowstone, was established by Congress in 1872. In 1916, Congress established the National Park Service to "promote and regulate" the use of national parks. While Congress has identified the purpose and objective of each National Park System Unit (in the enabling legislation of each unit), the overall management directive for the National Park System is to conserve natural, scenic and historic resources while providing for their enjoyment by today's citizens in a manner that will leave these resources unimpaired for future generations.

The risks, difficulties and costs that are incurred by utility companies in trying to obtain (and renew) rights of way across Indian Lands, are such that they are considered a constraint, and are avoided whenever possible.

The designation of wilderness areas, wilderness study areas, or wild and scenic rivers within National Parks does not remove these lands from the jurisdiction of the National Park Service. Such designations do, however, ensure that these legislatively protected areas will be consistently managed in accordance with the appropriate Congressional act.

While the National Park Service is authorized to grant leases and permits for the use of land to accommodate park visitors, the use of National Park land for utility corridors is more rigorously restricted. In general, corridors are excluded from protected areas within the park (such as Wilderness Areas) and in most cases, a right of way within National Park System areas will be considered only if there is no practical alternative use of the land.

National Conservation Area

The establishment of National Conservation Areas (NCA's) came about through separate statutory actions by Congress between 1970 and 1990. Some NCA's were included in broader legislation (such as FLPMA) while others were established by single-purpose statutes. Each establishing act identifies specific

resources and values that are to be protected, conserved and enhanced, as well as the dominant uses for each NCA. There are seven National Conservation Areas within the United States. Six of these areas are located in the eleven western states and all are managed by the Bureau of Land Management.

While there is no overall law or regulation governing the designation and management of NCAs, they have generally been set aside to protect and conserve nationally important natural and cultural resources while allowing compatible uses. In some cases, the establishment of an NCA may include a Wilderness Area or Wilderness Study Area within the NCA boundary. However, an NCA designation does not necessarily exclude commodity production activities, consumptive resource uses, or motorized recreation activities unless it is specifically mandated in the enabling legislation. Such uses are allowed where they do not significantly impact the critical values for which the NCA was established.

National Conservation Areas have generally been set aside to protect and conserve nationally important natural and cultural resources while allowing compatible uses.

National Wildlife Refuge

In 1903, Theodore Roosevelt established the first National Wildlife Refuge in the United States. Today there are more than 450 National Wildlife Refuges (NWR's) that include over 90 million acres of lands and water.

The National Wildlife Refuge System Administration Act of 1966, conferred jurisdiction over NWR's to the U.S. Fish and Wildlife Service (USFWS). The same Act also gave the USFWS the power to purchase lands to create National Wildlife Refuges without the approval of Congress. Other legislation that affects NWR's is the Endangered Species Act of 1973 which may preclude the USFWS's primary authority with another governing agency.

While National Wildlife Refuges are generally managed for the preservation of wildlife, specific management objectives vary from refuge to refuge depending on existing habitat types, wildlife use and regional characteristics. In most cases, the USFWS conducts compatibility studies to determine if new facilities can be permitted in the refuge, however, some NWR's contained existing rights of way or utility corridors when they were accepted into the system.

Wild & Scenic River

In 1968 Congress enacted the Wild and Scenic Rivers Act to preserve, in their free-flowing condition, certain rivers or tributaries with outstanding natural, cultural or recreational value. Rivers are classified Wild, Scenic or Recreational and are administered by either a federal or state agency. Each designated river is administered with the objective of non-degradation and enhancement of the

values which caused it to be designated. For federally administered rivers, the designated boundaries average approximately one-quarter of a mile on either side of the river in order to protect related natural, cultural and recreational values.

Rivers may be designated by Congress or the Secretary of the Interior. Before the Secretary of the Interior can designate a river, the river must have a state Wild and Scenic designation and the Governor of the state must apply to the Secretary. These rivers are managed by the state but receive the same level of Federal protection as Congressionally designated rivers.

There are numerous types of military installations that present development constraints similar to those of legislatively protected public lands and are considered highly restrictive to the location of utility corridors.

Military Use Area

Throughout the United States, there are numerous military installations that present development constraints similar to those of legislatively protected public lands. Many of these areas are considered highly restrictive to the location of utility corridors. The types of military use areas that are shown on the *Study* Corridor/Constraint maps include: academic institutions, air force bases, army bases, army depots, arsenals, bombing/firing ranges, high speed ground test centers, marine corps bases, military reserves and training and technical centers, military communication facilities, missile ranges, national guard installations, naval air space, naval air stations, naval oil shale reserves, naval weapons centers, and ordinance depots.

Other Federal Land (National Monument, Recreation Area and Scenic Area)

National Monuments (NM's) can be designated by either the President or Congress and are intended to preserve at least one nationally significant resource. NM's are a unit of the National Park System, however, they are generally smaller than a National Park, lack a Park's diversity of attractions, and often represent a specific theme.

National Recreation Areas (NRA's), which are designated by Congress, originally surrounded reservoirs impounded by dams built by other federal agencies. However, the concept of Recreation Area has grown to encompass a variety of lands and waterways. The purpose of NRA's is to provide for intensive recreational opportunities. NRA's are a unit of the National Park System, many of which are managed under cooperative agreement. For example, some National Recreation Areas are now administered by the Forest Service.

National Scenic Areas (NSA's) are a unit of the NPS, but are typically managed jointly by the Forest Service and local government

agencies. The primary management goal of National Scenic Areas is to protect scenic and visual resources of national significance. NSA's can be designated by either the Secretary of Agriculture or Congress.

State Designated Land

There are several types of state lands that receive some level of statutory protection and therefore, may constrain the location of utility corridors. Within this category, the *Corridor Study* maps include: state beaches, historic monuments, parks, recreation areas, reserves, wilderness, wildlife recreation areas and wildlife refuges.

Protecting the valuable natural resources of our nation is the goal of both Industry and the federal land management agencies alike. The local, state and federal regulations protecting these areas present many challenges to utility corridor siting in the West. The *Western Regional Corridor Study* is a valuable tool that can support both Industry regional utility planning and federal land management efforts.

There are several types of state lands that receive some level of statutory protection and therefore, may constrain the location of utility corridors.

CHAPTER 8
ABOUT THE CORRIDOR/CONSTRAINT MAPS

The *Western Regional Corridor Study* contains 14 maps: one map for each of the eleven western states (scale 1:750,000), with the exception of California which is comprised of two maps (north and south) and Montana which is also comprised of two maps (east and west). The eleven western states are also represented in a 1:2,500,000 scale regional map that encompasses all thirteen state maps.

In addition to the constraint categories identified in Chapter 7, the State Maps also show existing corridors, proposed corridors, agency designated corridors, agency designated windows, and energy source points (such as power plants, hydroelectric plants, major substations and gas fields).

The Regional Map is intended to provide a regional overview of the interstate corridor network and the land areas that constrain the location of corridors. All of the mapped information included on the state maps has been included on the Regional Map with the exception of designated corridors. This information was not included on the Regional Map in order to retain clarity of the other information. Also, in some cases constraint areas on the state maps were too small to be mapped on the Regional Map.

The remainder of this chapter identifies, by state, the Industry and Agency contributors, sources of information for the base map and constraint information, the federal planning documents that were reviewed to obtain or verify constraint data and information on designated corridors, and the names of the mapped constraint areas by constraint category.

The following abbreviations are used throughout Chapter 8:

AREA ABBREVIATIONS:

AFB – Air Force Base
NAS – Naval Air Station
NM – National Monument
NRA – National Recreation Area
NSA – National Scenic Area
NWR – National Wildlife Refuge
SP – State Park
SRA – State Recreation Area
WSA – Wilderness Study Area
SWRA – State Wildlife Refuge Area

The *Western Regional Corridor Study* contains 14 maps: one regional map that encompasses the eleven Western states and thirteen state maps – one for each of the eleven states except California and Montana which are comprised of two maps each.

ARIZONA

Study Participants

INDUSTRY
Arizona Public Service Company
AT&T
El Paso Electric Company
El Paso Natural Gas Company
MCI Telecommunications Company
Salt River Project
US Sprint
US WEST Communications

BUREAU OF LAND MANAGEMENT
Phoenix District
Safford District
Yuma District

FOREST SERVICE
Apache-Sitgraves National Forest (NF)
Coconino NF
Coronado NF
Kaibab NF
Prescott NF
Tonto NF

Base Map

USGS 1:500,000 Scale Series, State of Arizona Map, 1981

Constraint Area Data Sources

WILDERNESS AREAS
Bureau of Land Management State of Arizona Wilderness Status Map, 1991
USGS National Wilderness Preservation Systems Map, 1987

WILDERNESS STUDY AREAS
Bureau of Land Management State of Arizona Wilderness Status Map, 1991

INDIAN LANDS
Bureau of Indian Affairs "Indian Lands 1989" Map
Bureau of Land Management State of Arizona Wilderness Status Map, 1991
USGS 1:500,000 Scale Series, State of Arizona Map, 1981

NATIONAL PARKS
USGS 1:500,000 Scale Series, State of Arizona Map, 1981

NATIONAL CONSERVATION AREAS
USGS 1:500,000 Scale Series, State of Arizona Map, 1981

NATIONAL WILDLIFE REFUGES
Bureau of Land Management State of Arizona Wilderness Status Map, 1991
USGS 1:500,000 Scale Series, State of Arizona Map, 1981

WILD & SCENIC RIVERS
National Park Service, Wild & Scenic Rivers Act, December 31, 1990
USFS Tonto National Forest Plan, October, 1981

MILITARY USE AREAS
Bureau of Land Management State of Arizona Wilderness Status Map, 1991
USGS 1:500,000 Scale Series, State of Arizona Map, 1981

OTHER FEDERAL LANDS
Bureau of Land Management State of Arizona Wilderness Status Map, 1991
USGS 1:500,000 Scale Series, State of Arizona Map, 1981

STATE DESIGNATED LANDS
American Automobile Association State Road Maps
USGS 1:500,000 Scale Series, State of Arizona Map, 1981

Federal Planning Documents Reviewed

BUREAU OF LAND MANAGEMENT
Arizona Strip District – LRMP (1990).
Kingman Resource Area – Draft EIS (1990).
Lower Gila South – LRMP (1989); Final EIS (1985).
Phoenix District – LRMP EIS (1988).
Safford District – RMP Draft EIS (1989).
San Pedro River – RMP/Final EIS (1989).
Yuma District – LRMP/Final EIS (1985); Record of Decision (ROD) (1987).

FOREST SERVICE
Apache-Sitgreaves National Forests – Proposed Forest Plan (1986); Draft EIS (1986); Draft EIS Summary (1986); Public Comments and Forest Service Response to the Draft EIS (1987); Final EIS (1987); Forest Plan (1987); ROD (1987).

Coconino National Forest – Forest Plan (1987); Record of Decision (ROD) (1987).
Coronado National Forest – Proposed Forest Plan (1986); Forest Plan (1988); ROD (No Date).
Kaibab National Forest – Proposed Forest Plan (1986); Draft EIS (1986); Final EIS (1987); Forest Plan (1987); Public Comments and Forest Service Response to the Draft EIS (1988).
Prescott National Forest – Draft Forest Plan (1986).
Tonto National Forest – Proposed Forest Plan (1985).

Mapped Constraint Areas

WILDERNESS AREAS

Apache Creek
Aravaipa Canyon
Arrastra Mountain
Aubrey Peak
Baboquivari Peak
Bear Wallow
Beaver Dam Mountain
Big Horn Mountains
Castle Creek
Cedar Bench
Chiricahua
Cottonwood Point
Coyote Mountains
Dos Cabezas
Eagletail Mountains
East Cactus Plain
Escudilla
Fishhooks
Fossil Springs
Four Peaks
Galiuro
Gibraltar Mountain
Grand Wash Cliffs
Granite Mountain
Harcuvar Mountains
Harquahala Mountains
Hassayampa River Canyon
Havasu Refuge
Hells Canyon
Hellsgate
Hummingbird Springs
Imperial Refuge
Juniper Mesa
Kachina Peaks
Kanab Creek
Kendrick Mountain
Kofa Refuge
Mazatzal
Miller Peak
Mount Baldy
Mount Logan
Mount Nutt
Mount Tipton
Mount Trumbull
Mount Wilson
Mount Wrightson
Muggins Mountains
Munds Mountain
Needle's Eye
New Water Mountain
North Maricopa Mountains
Organ Pipe
North Santa Teresa
Paiute
Pajarita
Paria Canyon-Vermilion Cliffs
Peloncillo Mountains
Petrified Forest
Pine Mountain
Pusch Ridge
Rawhide Mountains
Red Rock-Secret Mountain
Redfield Canyon
Rincon Mountain
Saddle Mountain
Saguaro
Salome
Salt River Canyon
Santa Teresa
Sierra Ancha
Sierra Estrella
Signal Mountain
South Maricopa Mountains
Strawberry Crater
Superstition
Swansea
Sycamore Canyon
Table Top
Tres Alamos
Trigo Mountains
Upper Burro Creek
Wabayuma Peak
Warm Springs

ARIZONA *(continued)*

West Clear Creek
Wet Beaver
White Canyon
Woodchute
Woolsey Peak

WILDERNESS STUDY AREAS
Baker Canyon
Bunk Robinson
Cactus Plain
Glen Canyon NRA
Mount Graham
Whitmire Canyon

INDIAN LANDS
Cocopah
Colorado River
Fort Apache
Fort McDowell
Fort Mojave
Fort Yuma
Gila Bend
Gila River
Havasupai
Hopi
Hualapai
Kaibab
Maricopa
Navajo
Papago
Salt River
San Carlos
San Xavier

NATIONAL PARKS
Grand Canyon
Petrified Forest

NATIONAL CONSERVATION AREAS
Gila Box Riparian
San Pedro Riparian

NATIONAL WILDLIFE REFUGES
Cabeza Prieta
Cibola
Havasu
Imperial
Kofa

WILD & SCENIC RIVERS
Verde

MILITARY USE AREAS
Barry Goldwater Air Force Range
Buckeye National Guard Target Range
Davis Monthan Air Force Base
Electronic Proving Ground
Fort Huachuca Military Reserve
Marine Corps Air Station
Willcox Dry Lake Bombing Range
Yuma Proving Ground

OTHER FEDERAL LANDS
Canyon de Chelly National Monument (NM)
Coronado National Memorial
Chiricahua NM
Fort Bowie National Historic Site
Glen Canyon National Recreation Area (NRA)
Hohokam Pima NM
Lake Mead NRA
Montezuma Castle NM
Navajo NM
Organ Pipe Cactus NM
Pipe Spring NM
Saguaro NM
Sunst Crater NM
Tonto NM
Tuzigoot NM
Walnut Canyon NM
Wupatki NM

STATE DESIGNATED LANDS
Alamo Lake State Park (SP)
Buckskin Mountain SP
Lake Havasu SP
Patagonia Lake SP
Pichacho Peak SP

CALIFORNIA

Study Participants

INDUSTRY
AT&T
Los Angeles Department of Water and Power
MCI Telecommunications Corporation
Pacific Bell
Pacific Gas & Electric Company
Southern California Edison
Southern California Gas Company
US Sprint
Western Area Power Administration

BUREAU OF LAND MANAGEMENT
Bakersfield District
California Desert District
Susanville District
Ukiah District

FOREST SERVICE
Angeles National Forest (NF)
Cleveland NF
Eldorado NF
Inyo NF
Klamath NF
Lake Tahoe Basin Management Unit
Lassen NF
Los Padres NF
Mendocino NF
Modoc NF
Plumas NF
San Bernardino NF
Sequoia NF
Shasta-Trinity NF
Sierra NF
Six Rivers NF
Stanislaus NF
Tahoe NF

NORTHERN CALIFORNIA

Base Map

USGS 1:500,000 Scale Series, State of California, North Half, 1981

Constraint Area Data Sources

WILDERNESS AREAS
Bureau of Land Management State of California Wilderness Status Map, June 1988
USGS National Wilderness Preservation Systems Map, 1987

WILDERNESS STUDY AREAS
Bureau of Land Management State of California Wilderness Status Map, June 1988

INDIAN LANDS
Bureau of Indian Affairs "Indian Lands 1989" Map
Bureau of Land Management State of California Wilderness Status Map, June 1988
USGS 1:500,000 Scale Series, State of California Map, North Half, 1981

NATIONAL PARKS
USGS 1:500,000 Scale Series, State of California Map, North Half, 1981

NATIONAL CONSERVATION AREAS
Bureau of Land Management, CA Desert Conservation Area Plan, 1980
USGS 1:500,000 Scale Series, State of California Map, North Half, 1981

NATIONAL WILDLIFE REFUGES
Bureau of Land Management State of California Wilderness Status Map, June 1988
USGS 1:500,000 Scale Series, State of California Map, North Half, 1981

WILD & SCENIC RIVERS
National Park Service Wild & Scenic Rivers Act, through December 1990

MILITARY USE AREAS
Bureau of Land Management State of California Wilderness Status Map, June 1988
USGS 1:500,000 Scale Series, State of California Map, North Half, 1981

OTHER FEDERAL LANDS
Bureau of Land Management State of California Wilderness Status Map, June 1988
USGS 1:500,000 Scale Series, State of California Map, North Half, 1981

STATE DESIGNATED LANDS
American Automobile Association State Road Maps
USGS 1:500,000 Scale Series, State of California Map, North Half, 1981

Federal Planning Documents Reviewed

BUREAU OF LAND MANAGEMENT
Arcata Planning Area – Draft RMP/EIS (1987); Final RMP/EIS (1989); Record of Decision (ROD) (1992).
California Statewide Wilderness Study Report-Record of Decision (1991); Overview (1991); National Monuments Expansion (1991).
Redding Resource Area – Draft RMP/EIS (1991).
Sierra Planning Area – Draft Management Framework Plan Amendment and Environmental Assessment (No Date).

NORTHERN CALIFORNIA *(continued)*

FOREST SERVICE

Eldorado National Forest – LRMP EIS (1987); LRMP (1988); Final EIS Appendix Volume (No Date); Final EIS Appendix N – Public Response (No Date); ROD (1989).

Klamath National Forest – King – Titus Fire Recovery Project – Draft EIS (1989); Final EIS (1990); ROD (1990).

Klamath National Forest-Baldy Fire Recovery Project – Draft EIS (1989); Draft EIS Summary (1989); Final EIS (1990).

Klamath National Forest – Grider Fire Recovery Project – Draft EIS (1988); Final EIS (1989); ROD (1989).

Lake Tahoe Basin Management Unit – LRMP (1988); LRMP Final EIS and Appendix Volume (1988); ROD (1988).

Lassen National Forest – LRMP Draft EIS (1986); Highlights of the Draft EIS and Proposed LRMP (1986).

Mendocino National Forest – Proposed LRMP (1986); LRMP Draft EIS (1986).

Modoc National Forest – Draft LRMP (1987); LRMP Draft EIS (1987).

Plumas National Forest – LRMP (1988); LRMP EIS and Public Comments Appendix (1988); ROD (1988).

Shasta-Trinity National Forest – LRMP (1986); LRMP Draft EIS (1986).

Sierra National Forest – Proposed LRMP (1986); Draft EIS and Appendices (1986); Reader's Guide to Proposed LRMP and Draft EIS (1986); LRMP (1991); LRMP Final EIS and Appendices (1991); Final EIS Appendix T – Public Comments (1991); LRMP Summary (1991); ROD (1992).

Six Rivers National Forest – Draft Forest Plan EIS (1986); Draft Forest Plan (1986).

Stanislaus National Forest – Proposed LRMP (1985); Draft LRMP, Draft EIS (1986); Draft LRMP (1990); and LRMP Draft EIS (1990).

Tahoe National Forest-Proposed LRMP (1985); Draft EIS and Appendices (1986); LRMP EIS (1990); LRMP and Appendices (1990); LRMP Public Participation Appendix; ROD (1990).

Mapped Constraint Areas

WILDERNESS AREAS

Ansel Adams
Bucks Lake
Caribou
Carson-Iceberg
Castle Crags
Chanchelulla
Desolation
Dinkey Lakes
Emigrant
Granite Chief
Hoover
Ishi
John Muir
Kaiser
Lassen Volcanic
Lava Beds
Marble Mountain
Mokelumne
Mount Shasta
North Fork
Point Reyes
Red Buttes
Russian
Siskiyou
Snow Mountain
South Warner
Thousand Lakes
Trinity Alps
Yolla Bolly-Middle Eel
Yosemite

WILDERNESS STUDY AREAS

Antelope Spring
Benton Range
Big Butte
Bitterbrush
Black Canyon
Bodie
Bodie Mountain
Buffalo Hills
Carson Iceberg (NV 030-532)
Casa Diablo
Cedar Roughs
Chemise Mountain
Chidago Canyon
Cottonwood Creek
Coyote Southeast
Dry Valley Rim

Eden Valley
Excelsior
Fish Slough
Five Springs
Granite Mountain
King Range
Last Chance Mountain
Lava
Little Sand Spring
Masonic Mountain
McAffee Creek
Merced River
Mount Biedeman
North Death Valley
North Tip
Northwest Fishlake Valley
Piper Mountain
Pit River Canyon
Red Mountain
Rocky Creek/Cache Creek
Saline Valley
Skedaddle
Slinkard (NV 030-531)
South Warner Contiguous
Sweetwater
Sylvania Mountains
Thatcher Ridge
Timbered Crater
Toler Creek
Tule Mountain
Tunnison Mountain
Twin Peaks
Volcanic Tablelands
Walford Springs
Wheeler Ridge
White Mountain
Wyman Creek
Yolla Bolly
C-5986
4-662
4-666

INDIAN LANDS
Alturas
Bishop
Fort Bidwell
Hoopa Valley
Round Valley
XL Ranch
Yurok

NATIONAL PARKS
Lassen Volcanic
Point Reyes National Seashore
Redwood
Yosemite

NATIONAL CONSERVATION AREAS
King Range

NATIONAL WILDLIFE REFUGES
Clear Lake
Colusa
Delevan
Kesterson
Lower Klamath
Modoc
Sacramento
San Francisco Bay
San Pablo Bay
Sutter Tule Lake

WILD & SCENIC RIVERS
American River
  North Fork
Eel River
  North Fork
  Middle Fork
  South Fork
Feather River
  Middle Fork
Klamath River
Merced River
  South Fork
Salmon River
  North Fork
  South Fork
Scott River
Smith River
  North Fork
  Middle Fork
  South Fork
Trinity River
  North Fork
  South Fork
Tuolumme River
Van Duzen River
Wooley Creek

MILITARY USE AREAS
Alameda Naval Air Station (NAS)
Beale Air Force Base (AFB)
Camp Parks Military Reserve

NORTHERN CALIFORNIA *(continued)*

Castle AFB
Concord Naval Weapons Station
Mare Island Naval Reserve
Mather AFB
McClellan AFB
Moffett Field NAS
Presidio of San Francisco Military Reserve
Sierra Army Depot
Travis AFB
Treasure Island
US Military Reserves

OTHER FEDERAL LANDS

Devils Postpile National Monument (NM)
Golden Gate National Recreation Area (NRA)
Lava Beds NM
Mono Lake National Scenic Area
Muir Woods NM
Whiskeytown-Shasta-Trinity NRA

STATE DESIGNATED LANDS

Ahjumawi Lava Springs State Park (SP)
Annadel SP
Austin Creek State Recreation Area (SRA)
Bethany Reservoir SRA
Bothe-Napa Valley SP
Butano SP
Calaveras Big Trees SP
Castle Crags SP
Castle Rock SP
Clear Lake SP
D.L. Bliss SP
Del Norte Coast Redwoods SP
Dry Lagoon SP
Emerald Bay SP
Folsom Lake SRA
Franks Tract SRA
Frenchman Reservoir SRA
Hendy Woods SP
Henry W. Coe SP
Henry W. Coe State Wilderness (SW)
Humboldt Redwoods SP
Jedediah Smith Redwoods SP
Lake Oroville SRA
Malakoff Diggins State Historical Park (SHP)
Manchester State Beach (SB)
Montgomery Woods State Preserve
Mount Diablo SP
Mount Tamalpais SP
Plumas-Eureka SP
Portola SP
Prairie Creek Redwoods SP
Robert L. Stevenson SP
Russian Gulch SP
Salt Point SP
Samuel P. Taylor SP
Sinkyone Wilderness SP
Sonoma Coast SB
Spenceville Wildlife and Recreation Area
Standish-Hickey SRA
Sugar Pine Point SP
Sugarloaf Ridge SP
Van Damme SP

SOUTHERN CALIFORNIA

Base Map

USGS 1:500,000 Scale Series, State of California Map, South Half, 1981

Constraint Area Data Sources

WILDERNESS AREAS

Bureau of Land Management State of California Wilderness Status Map, June 1988
USGS National Wilderness Preservation Systems Map, 1987

WILDERNESS STUDY AREAS

Bureau of Land Management State of California Wilderness Status Map, June 1988
USGS 1:500,000 Scale Series, State of California Map, South Half, 1981

INDIAN LANDS

Bureau of Indian Affairs "Indian Lands 1989" Map
Bureau of Land Management State of California Wilderness Status Map, June 1988
USGS 1:500,000 Scale Series, State of California Map, South Half, 1981

NATIONAL PARKS

USGS 1:500,000 Scale Series, State of California Map, South Half, 1981

NATIONAL CONSERVATION AREAS

Bureau of Land Management, CA Desert Conservation Area Plan, 1980

USGS 1:500,000 Scale Series, State of California Map, South Half, 1981

NATIONAL WILDLIFE REFUGES

Bureau of Land Management State of California Wilderness Status Map, June 1988

USGS 1:500,000 Scale Series, State of California Map, South Half, 1981

WILD & SCENIC RIVERS

National Park Service Wild & Scenic Rivers Act, through December 1990

MILITARY USE AREAS

Bureau of Land Management State of California Wilderness Status Map, June 1988

USGS 1:500,000 Scale Series, State of California Map, South Half, 1981

OTHER FEDERAL LANDS

Bureau of Land Management State of California Wilderness Status Map, June 1988

USGS 1:500,000 Scale Series, State of California Map, South Half, 1981

STATE DESIGNATED LANDS

American Automobile Association State Road Maps

USGS 1:500,000 Scale Series, State of California Map, South Half, 1981

Federal Planning Documents Reviewed

BUREAU OF LAND MANAGEMENT

Bishop Resource Area-RMP/Draft EIS (1990); Final EIS Vos. I and II (1991).

California Desert District – Conservation Area Plan (1980); Proposed 1989/1990 CDCA Plan Amendments and Environmental Assessment.

California Statewide Wilderness Study Report-Record of Decision (ROD) (1991); Overview (1991); National Monuments Expansion (1991).

Coast/Valley Planning Area – Draft RMP/EIS (1984); ROD and Rangeland Program Summary (1985).

Desert Conservation – A Management Showcase (1991).

Hollister Resource Management Plan and ROD (1984).

Sierra Planning Area-Draft Management Framework Plan Amendment and Environmental Assessment (No Date).

South Coast Planning Area-Draft RMP/EIS (1991).

FOREST SERVICE

Angeles National Forest – Cleveland National Forest – LRMP (1986); Final EIS and Appendix Volume (1986); ROD (1986); LRMP (1987); LRMP, Final EIS, and Appendix Volume (No Date); ROD (1987).

Los Padres National Forest-LRMP (No Date); LRMP Final EIS (No Date); LRMP (1987); Final EIS and Appendix Volume (No Date); ROD (1987).

San Bernadino National Forest – Final LRMP (1988); Final EIS and Appendices (No Date).

Sequoia National Forest – LRMP (1988); LRMP Final EIS and Appendices (1988); ROD (1988); LRMP (1990); Mediated LMP Settlement Agreement (1990).

Sierra National Forest – Proposed LRMP (1986); Draft EIS and Appendices (1986); Reader's Guide to Proposed LRMP and Draft EIS (1986); LRMP (1991); LRMP Final EIS and Appendices (1991); Final EIS Appendix T – Public Comments (1991); LRMP Summary (1991); ROD (1992).

Mapped Constraint Areas

WILDERNESS AREAS

Agua Tibia
Cibola
Cucamonga
Dick Smith
Dinkey Lakes
Dome Land
Golden Trout
Hauser
Jennie Lakes
John Muir
Joshua Tree
Kaiser
M'achesna
Monarch
Pine Creek
Pinnacles
San Mateo Canyon

SOUTHERN CALIFORNIA *(continued)*

San Gabriel
San Gorgonio
San Jacinto
San Rafael
Santa Lucia
Santa Rosa
Sheep Mountain
South Sierra
Ventana

WILDERNESS STUDY AREAS

A 5189
AZ 050-010
AZ 050-004
AZ 050-035
AZ 050-003
Amboy Crater
Aqua Tibia
Avawatz Mountains
Bear Mountain
Beauty Mountain G
Big Maria Mountains
Bigelow Cholla Garden
Bighorn Mountains
Black Canyon
Black Mountain
Blackwater Well
Bristol/Granite Mountains
Cady Mountains
Caliente
Carrizo Gorge/Eastern McCain Valley A
Castle Peaks
Cerro Gordo
Cerro Gordo Peak
Chemehuevil Mountains
Chuckwalla Mountains
Cima Dome
Cinder Cones
Clark Mountain
Cleghorn Lakes
Clipper Mountains
Coso Range
Cow Heaven
Coxcomb Mountains
Coyote Southeast
Coyote Mountains
Crater Mountain
Darwin Falls
Dead Mountains
Deer Spring
Eagle Mountains
Eight Mile Tank
El Paso Mountains
Essex
Fish Creek Mountains
Fort Piute
Frog Creek
Funeral Mountains
Golden Valley
Grass Valley
Great Falls Basin
Greenwater Range
Greenwater Valley
Hauser Mountain C
Hollow Hills
Horse Canyon
Hunter Mountain
Ibex Hills
Ibex Spring
Independence Creek
Indian Pass
Inyo Mountains
Jacumba
Kelso Creek Valley
Kelso Dunes
Kelso Peak
Kelso Mountains
Kingston Range
Lava Hills
Little Chuckwalla Mountains
Little Lake Canyon
Little Sand Spring
Little Picacho Peak
Lower Saline Valley
Magee/Adkins
Manly Peak
Marble Mountains
Mecca Hills
Mesquite Mountains
Mesquite Spring
Mid Hills
Middle Park Canyon
Milk Ranch/Case Mountain
Morongo
Moses
New York Mountains
Newberry Mountains

Nopah Range
North Algodones Dunes
North Argus Range
North Death Valley
North Coso Range
North Mesquite Mountains
Old Dad Mountain
Old Woman Mountains
Orocopia Mountains
Owens Peak
Owlshead Mountains
Pahrump Valley
Paiute
Palen/McCoy
Palo Verde Mountains
Panamint Dunes
Panoche Hills North
Panoche Hills South
Picacho Peak
Pilot Peak
Pinnacles
Pinto Basin
Pinto Mountains
Piute-Cypress
Piute Mountains
Providence Mountains
Rainbow Wells
Red Mountain
Resting Spring Range
Rice Valley
Rockhouse
Rodman Mountains
Sacramento Mountains
Saddle Peak Mountains
Saline Dunes
Saline Valley
San Benito
San Felipe Hills
San Ysidro Mountain
Santa Rosa Mountains
Sawtooth Mountains A
Sawtooth Mountains B
Sawtooth Mountains C
Scodie
Shadow Valley
Sheep Ridge
Sheephole-Cadiz
Ship Mountains
Signal Hill
Silurian Valley
Skinner Peak
Slate Range
Sleeping Beauty Mountains
Soda Mountains
South Avawatz Mountains
South Nopah Range
South Algodones Dunes
South Bristol Mountains
South Providence Mountains
South Saddle Peak Mountain
Southern Inyo
Southern Otay Mountain
Stepladder Mountains
Surprise Canyon
Symmes Creek
Table Mountain
Teutonia Peak
Turtle Mountains
Valley View
Waucoba Wash
Western Otay Mountain
Whipple Mountains
White Water
Wildrose Canyon
Woods Mountains

INDIAN LANDS

Agua Caliente
Augustine
Barona Ranch
Cabezon
Cahuilla
Campo
Capitan Grande
Chemehuevi
Colorado River
Cuyapaipe
Fort Mohave
Fort Yuma (Quechan)
Inaja/Cosmit
La Jolla
La Posta
Laguna
Los Coyotes
Manzanita
Mesa Grande
Mission
Morongo
Pala

SOUTHERN CALIFORNIA *(continued)*

Pechanga
Ramona
Rincon
San Pasqual
Santa Rosa
Santa Ysabel
Soboba
Torres Martinez
Tule River
Twentynine Palms
Viejas

NATIONAL PARKS

Channel Islands
Kings Canyon
Sequoia

NATIONAL CONSERVATION AREAS

California Desert District

NATIONAL WILDLIFE REFUGES

Cibola
Imperial
Kern
Kesterson
Merced
Pixley
Salton Sea
San Luis
Sunset Beach

WILD & SCENIC RIVERS

Kern River
  South Fork
Kings River
  Middle Fork
  South Fork

MILITARY USE AREAS

Camp Pendleton Marine Corps Base
Camp Roberts Military Reserve
Camp San Luis Obispo
China Lake Naval Weapons Center (Mojave Range B)
Chocolate Mountains Aerial Gunnery Range (Chocolate Mountain Impact Area)
Cuddleback Lake Air Force Range
Edwards Air Force Base (AFB)
El Centro Naval Air Facility
Fort Irwin Military Reserve
Fort Rosencrans
Fort Ord Military Reserve
George AFB
Goldstone Communication Complex
Hunter Liggett Military Reserve
Lemoore Naval Air Station (NAS)
March AFB
Miramar NAS
Naval Development & Training Center
Naval Petroleum Reserve #1
Naval Petroleum Reserve #2
Naval Radio Station
Naval Weapons Center
Oxnard AFB
Point Mugu NAS
Presidio of Monterey Military Reserve
Salton Sea Test Base
Twentynine Palms Marine Corps Base
US Naval Reserve (San Clemente Island & Oxnard Beach)
Vandenburg AFB

OTHER FEDERAL LANDS

Cabrillo National Monument (NM)
Death Valley NM
Joshua Tree NM
Pinnacles NM
Santa Monica Mountains National Recreation Area

STATE DESIGNATED LANDS

Andrew Molera State Park (SP)
Anza-Borrego Desert State Wilderness (SW)
Big Basin Redwoods SP
Border Field SP
Butano SP
Castle Rock SP
Cuyamaga Mountains SW
Cuyamaca Rancho SP
Forest of Nisene Marks SP
Garrapata SP
Hastings Natural History SP
Hearst San Simeon State Historical Monument
Henry Cowell Redwoods SP
Henry W. Coe SP
Henry W. Coe SW
Hollister Hills State Vehicular Recreation Area (SVRA)
Saddle Back Butte State Park SP
Julia Pfeiffer Burns SP
Kern River State Recreation Area (SRA)
La Purisima Mission State Historic Park

Lake Elsinore SP
Lake Perris SRA
Leo Carrillo State Beach (SB)
Malibu Creek SP
Millerton Lake SRA
Montana De Oro SP
Morro Bay SP
Mount San Jacinto SW
Ocotillo Wells SVRA
Palomar Mountain SP
Pfeiffer-Big Sur SP
Picacho SRA
Pismo Dunes SVRA
Pismo SB
Point Mugu SP
Providence Mountains SRA
Red Rock Canyon SRA
Saddle Back Butte SP
Salton Sea SRA
San Luis Reservoir SRA
San Onofre SB
San Simeon SB
Santa Rosa Mountains SW
Topanga SP
Tule Elk State Reserve
West Waddell Creek SW
Wilder Ranch SP

COLORADO

Study Participants

INDUSTRY
AT&T
Colorado Interstate Gas Company
Colorado Springs Utilities
Coors Energy Company
El Paso Natural Gas Company
MCI Telecommunications Corporation
Northwest Pipeline Corporation
Pacific Power & Light Company
Public Service Company of Colorado
Questar Pipeline Company
Rocky Mountain Natural Gas Company
Salt River Project
Shell Pipeline Company
Tri-State Generation & Transmission Associates
US Sprint
Western Area Power Administration
Western Gas Supply Company

BUREAU OF LAND MANAGEMENT
Canon City District
Craig District
Grand Junction District
Montrose District

FOREST SERVICE
Arapahoe National Forest (NF)
Grand Mesa NF
Gunnison NF
Pike NF
Rio Grande NF
Roosevelt NF
Routt NF
San Isabel NF
San Juan NF
Uncompahgre NF
White River NF

Base Map

USGS 1:500,000 Scale Series, State of Colorado Map, 1980

Constraint Area Data Sources

WILDERNESS AREAS
Bureau of Land Management State of Colorado Wilderness Status Map, 1986
USGS National Wilderness Preservation Systems Map, 1987

WILDERNESS STUDY AREAS
Bureau of Land Management State of Colorado Wilderness Status Map, 1986

INDIAN LANDS
Bureau of Indian Affairs "Indian Lands 1989" Map
Bureau of Land Management State of Colorado Wilderness Status Map, 1986
USGS 1:500,000 Scale Series, State of Colorado Map, 1980

NATIONAL PARKS
USGS 1:500,000 Scale Series, State of Colorado Map, 1980

NATIONAL WILDLIFE REFUGES
Bureau of Land Management State of Colorado Wilderness Status Map, 1986
USGS 1:500,000 Scale Series, State of Colorado Map, 1980

WILD & SCENIC RIVERS
National Park Service Wild & Scenic Rivers Act, through December 1990

COLORADO *(continued)*

MILITARY USE AREAS

Bureau of Land Management State of Colorado Wilderness Status Map, 1986

USGS 1:500,000 Scale Series, State of Colorado Map, 1980

OTHER FEDERAL LANDS

Bureau of Land Management State of Colorado Wilderness Status Map, 1986

USGS 1:500,000 Scale Series, State of Colorado Map, 1980

STATE DESIGNATED LANDS

American Automobile Association State Road Maps

USGS 1:500,000 Scale Series, State of Colorado Map, 1980

Federal Planning Documents Reviewed

BUREAU OF LAND MANAGEMENT

Glenwood Springs Resource Area – Record of Decision (ROD) and RMP (1988).

Grand Junction Resource Area – RMP and ROD (1987); Final Wilderness EIS (1989).

Intensive Wilderness Inventory Final Wilderness Study Areas (1980).

Kremmling Resource Area – RMP and ROD (No Date).

Little Snake-RMP and ROD (1989).

Piceance Basin – RMP and ROD (1987).

San Juan/San Miguel Planning Area-RMP (1985).

San Luis Resource Area – Proposed RMP and Final EIS (1991).

Uncompahgre Basin – RMP and ROD (1989).

FOREST SERVICE

Pike and Isabel National Forests/Cimarron National Grassland – LRMP (1986)

Rocky Mountain Region – Draft Regional Guide (1990); Supplemental Draft EIS (1991); Supplement to the Final EIS (No Date); Regional Guide (1992).

Mapped Constraint Areas

WILDERNESS AREAS

Big Blue
Black Canyon of the Gunnison
Cache La Poudre
Collegiate Peaks
Comanche Peak
Eagles Nest
Flat Tops
Great Sand Dunes
Holy Cross
Hunter Frying Pan
Indian Peaks
La Garita
Lizard Head
Lost Creek
Maroon Bells Snowmass
Mesa Verde
Mount Evans
Mount Massive
Mount Sneffels
Mount Zirkel
Neota
Never Summer
Platte River
Ragged
Ramah
South San Juan
Weminuche
West Elk

WILDERNESS STUDY AREAS

Adobe Badlands
American Flats
Beaver Creek
Black Ridge Canyons
Black Ridge Canyons West
Black Canyon
Black Mountain
Browns Canyon
Buffalo Peaks
Bull Canyon
Bull Gulch
Cahone Canyon
Camelback
Cannibal Plateau
Castle Peak
Cold Springs West
Colorado National Monument 909
Cross Canyon
Cross Mountain
Davis Peak
Demaree Canyon
Diamond Breaks
Dinosaur National Monument
Dinosaur National Monument 913

Dolores River Canyon
Dominguez Canyon
Eagle Mountain
Fossil Ridge
Greenhorn Mountain
Gunnison Gorge
Handies Peak
Little Bookcliffs Wildhorse Area
Lower Grape Creek
McIntyre Hills
McKenna Peak
Menefee Mountain
Needle Creek
Oil Spring Mountain
Papa Keal
Piedra
Pinery Creek
Platte River Contiguous
Powderhorn
Red Cloud Peak
Rocky Mountain National Park 925
San Luis Hills
Sand Castle
Sangre De Cristo
Service Creek
Sewemvp Mesa
Skull Creek
Slumgullion Slide
South Piney Creek
South San Juan
Spanish Peaks
Sparling Gulch/Friends Creek
Spruce Creek
Squaw/Papoose Canyon
Tabeguache Creek
The Palisade
Troublesome
Upper Grape Creek
Vasquez Peak
Weber Mountain
Weminuche Contiguous
West Needles
West Needles Contiguous
Wheeler Geologic Area
White Head Gulch
Willow Creek
Windy Gulch
Zapata Creek

INDIAN LANDS
Southern Ute
Ute Mountain

NATIONAL PARKS
Mesa Verde
Rocky Mountain

NATIONAL WILDLIFE REFUGES
Alamosa
Arapahoe
Browns Park
Monte Vista

WILD & SCENIC RIVERS
Cache La Poudre River
South Fork

MILITARY RESERVATIONS
Buckley Air National Guard Base
Fort Carson Military Reservation
High Speed Ground Test Center
(Department of Transportation)
Military Reserve
Naval Oil Shale Reserve
Peterson Air Force Base
Pueblo Ordnance Depot
Rocky Flats Plant
Rocky Mountain Arsenal
US Air Force Academy

OTHER FEDERAL LANDS
Arapahoe National Recreation Area (NRA)
Black Canyon of the Gunnison National
Monument (NM)
Colorado NM
Curecanti NRA
Dinosaur NM
Florissant Fossil Beds NM
Great Sand Dunes NM
Shadow Mountain NRA

STATE DESIGNATED LANDS
Antero Reservoir State Recreation Area
(SRA)
Barr Lake State Park (SP)
Bonny Reservoir SRA
Boyd Lake SP
Buckhorn Lakes SP
Chatfield Reservoir SRA
Cherry Creek Lake SRA
Crawford Reservoir SRA
Elevenmile Reservoir SRA

COLORADO *(continued)*

Golden Gate Canyon SP
Jackson Lake SRA
Highline Lake SRA
Lathrop SP
Lory SP
Miramonte SRA
Navajo Reservoir SRA
Paonia Reservoir SRA
Pueblo Reservoir SRA
Rifle Falls SRA
Rifle Gap SRA
Roxborough SP
Steamboat Lake SP
Sweitzer Lake SRA
Tarryall Reservoir SRA
Trinidad SRA

IDAHO

Study Participants

INDUSTRY
AT&T
Bonneville Power Administration
Idaho Power Company
Montana Power Company
Northwest Pipeline Corporation
Sierra Pacific Power Company
US Sprint
US WEST Communications
Utah Power & Light Company
Washington Water Power Company

BUREAU OF LAND MANAGEMENT
Boise District
Burley District
Coeur d' Alene District
Idaho Falls District
Salmon District
Shoshone District

FOREST SERVICE
Boise National Forest (NF)
Caribou NF
Challis NF
Clearwater NF
Idaho NF
Nez Perce NF
Panhandle NF
Payette NF
Salmon NF
Sawtooth NF
Targhee NF

Base Map

USGS 1:500,000 Scale Series, State of Idaho Map, 1976

Constraint Area Data Sources

WILDERNESS AREAS
Bureau of Land Management State of Idaho Wilderness Status Map, 1986
US Forest Service, Frank Church River of No Return Wilderness Map, 1984
USGS National Wilderness Preservation Systems Map, 1987

WILDERNESS STUDY AREAS
Bureau of Land Management State of Idaho Wilderness Status Map, 1986

INDIAN LANDS
Bureau of Indian Affairs "Indian Lands 1989" Map
Bureau of Land Management State of Idaho Wilderness Status Map, 1986
USGS 1:500,000 Scale Series, State of Idaho Map, 1976

NATIONAL PARKS
USGS 1:500,000 Scale Series, State of Idaho Map, 1976

NATIONAL WILDLIFE REFUGES
Bureau of Land Management State of Idaho Wilderness Status Map, 1986
USGS 1:500,000 Scale Series, State of Idaho Map, 1976

WILD & SCENIC RIVERS
Bureau of Land Management State of Idaho Wilderness Status Map, 1986
National Park Service Wild & Scenic Rivers Act, through December 1990

MILITARY USE AREAS
Bureau of Land Management State of Idaho Wilderness Status Map, 1986
USGS 1:500,000 Scale Series, State of Idaho Map, 1976

OTHER FEDERAL LANDS
Bureau of Land Management State of Idaho Wilderness Status Map, 1986
USGS 1:500,000 Scale Series, State of Idaho Map, 1976

STATE DESIGNATED LANDS

American Automobile Association Idaho Road Maps

USGS 1:500,000 Scale Series, State of Idaho Map, 1976

Federal Planning Documents Reviewed

BUREAU OF LAND MANAGEMENT

1991 Briefing Statements.

FOREST SERVICE

Bitterroot National Forest – Forest Plan (1987); Final EIS and Appendices (1987); Final EIS Summary (1987); Record of Decision (ROD) (1987).

Boise National Forest – LRMP (No Date); Public Comments on the EIS (1988); Final EIS and Appendices (No Date); Final EIS Summary (No Date); ROD (1990).

Caribou National Forest – LRMP (No Date); Final EIS Vos. I & II; Revisions to Draft EIS Appendix (No Date); ROD (1985).

Challis National Forest – LRMP (No Date); Public Comments on Draft EIS (No Date); Final EIS and Appendices (No Date); LRMP and Final EIS Summary (No Date); ROD (1987).

Clearwater National Forest – Forest Plan (1987); EIS Vos. I & II (1987); ROD (1987).

Idaho Panhandle National Forests–Proposed Forest Plan (1986); Forest Plan (1987); Final EIS and Appendices (1987); ROD (1987).

Nez Perce National Forest – Forest Plan (1987); Final EIS and Appendices (1987); ROD (1987).

Payette National Forest – LRMP (No Date).

Salmon National Forest – LRMP and Appendices (No Date); Final EIS (No Date); ROD (1988).

Sawtooth National Forest – LRMP (No Date); ROD (1987).

Targhee National Forest – Land Management Plan (No Date); Planning Briefing Guide #5 (1985).

Mapped Constraint Areas

WILDERNESS AREAS

Craters of the Moon
Frank Church River of No Return
Gospel Hump
Hells Canyon
Sawtooth
Selway-Bitterroot

WILDERNESS STUDY AREAS

Appendicitis Hill
Battle Creek
Bear Den Butte
Big Jacks Creek
Black Butte
Black Canyon
Borah Peak
Boulder Creek
Box Creek
Bruneau River
Burnt Creek
Cedar Butte
Corral-Horse Basin
Crystal Lake
Deer Creek
Duncan Creek
Eighteen Mile
Friedman Creek
Goldburg
Gooding City of Rocks
Grandmother Mountain
Great Rift
Hawley Mountain
Hell's Half Acre
Henry's Lake
Horsehead Spring
Jarbridge River
Jerry Peak
Jerry Peak West
Juniper Creek
King Hill Creek
Lava
Little City of Rocks
Little Deer
Little Jacks Creek
Little Owyhee River
Little Wood River
Lookout Butte
Lower Salmon Falls Creek
Marshall Mountain
Owyhee River Canyon
Owyhee River-Deep Creek
Owyhee River, Middle Fork
Owyhee River, North Fork
Owyhee River, South Fork
Petticoat Peak

IDAHO *(continued)*

Pole Creek
Raven's Eye
Sand Mountain
Sand Butte
Sawtooth Wilderness
Selkirk Crest
Shale Butte
Sheep Creek East
Sheep Creek West
Shoshone
Snake River Birds of Prey
Snowhole Rapids
South Fork Snake River Islands
Squaw Creek Canyon
Upper Deep Creek
West Fork Red Canyon
White Knob Mountains
Yatahoney Creek
Yellowstone

INDIAN LANDS
Coeur d'Alene
Duck Valley
Fort Hall
Nez Perce

NATIONAL PARKS
Yellowstone

NATIONAL WILDLIFE REFUGES
Bear Lake
Camas
Deer Flat
Grays Lake
Kootenai
Minidoka

WILD & SCENIC RIVERS
Clearwater
  Middle Fork
Lochsa
Rapid
Saint Joe
Salmon River
  Middle Fork
Salmon River
Selway
Snake River

MILITARY USE AREAS
Three Military Areas

OTHER FEDERAL LANDS
Craters of the Moon National Monument
Sawtooth National Recreation Area

STATE DESIGNATED LANDS
Bruneau Dunes State Park (SP)
Farragut SP
Heyburn SP
Indian Rocks SP
McCroskey SP
Ponderosa SP

MONTANA

Study Participants

INDUSTRY
AT&T
Bonneville Power Administration
Idaho Power
Montana-Dakota Utilities
Montana Power Company
Pacific Power & Light Company
US Sprint
US WEST Communications
Westen Area Power Adminstration

BUREAU OF LAND MANAGEMENT
Butte District
Lewistown District
Miles City District

FOREST SERVICE
Beaverhead National Forest (NF)
Bitterroot NF
Custer NF
Deerlodge NF
Flathead NF
Gallatin NF
Helena NF
Kootenai NF
Lewis & Clark NF
Lolo NF

EASTERN MONTANA

Base Map

USGS 1:500,000 Scale Series, State of Montana Map, East Half, 1984

Constraint Area Data Sources

WILDERNESS AREAS
Bureau of Land Management State of Montana Wilderness Status Map, 1986

USGS National Wilderness Preservation Systems Map, 1987

WILDERNESS STUDY AREAS

Bureau of Land Management State of Montana Wilderness Status Map, 1986

INDIAN LANDS

Bureau of Indian Affairs "Indian Lands 1989" Map

Bureau of Land Management State of Montana Wilderness Status Map, 1986

USGS 1:500,000 Scale Series, State of Montana Map, East Half, 1984

NATIONAL PARKS

USGS 1:500,000 Scale Series, State of Montana Map, East Half, 1984

NATIONAL WILDLIFE REFUGES

Bureau of Land Management State of Montana Wilderness Status Map, 1986

USGS 1:500,000 Scale Series, State of Montana Map, East Half, 1984

WILD & SCENIC RIVERS

National Park Service Wild & Scenic Rivers Act, through December 1990

OTHER FEDERAL LANDS

Bureau of Land Management State of Montana Wilderness Status Map, 1986

USGS 1:500,000 Scale Series, State of Montana Map, East Half, 1984

STATE DESIGNATED LANDS

American Automobile Association State Road Maps

USGS 1:500,000 Scale Series, State of Montana Map, East Half, 1984

Federal Planning Documents Reviewed

BUREAU OF LAND MANAGEMENT

Access-Supplement to State Director, Guidance for Resource Management Planning in Montana and the Dakotas (1989).

Billings Resource Area – RMP Final EIS (1983); Final Wilderness EIS (1988).

Bitter Creek Wilderness – Final EIS (1989).

Interim Management Policy and Guidelines for Lands under Wilderness Review (1987).

Judith Valley Phillips – Draft EIS (1991); RMP/EIS (1991).

Missouri Breaks Wilderness – Suitability Study/Final EIS (1987).

Powder River Resource Area – RMP (1984); Final Wilderness EIS (1989).

West HiLine RMP Draft EIS (1987); RMP/Final EIS (1988); Record of Decision (ROD) (1988).

FOREST SERVICE

Custer National Forest – Final EIS and Appendices (1986); Management Plan (1986); Corridor Planning Information; ROD (1987).

Gallatin National Forest – Forest Plan (No Date); Final EIS (No Date); ROD (1987).

Lewis and Clark National Forest – Draft Forest Plan (1986); Final EIS Vos. 1 and 2 (No Date); Final EIS Appendices (No Date); Overview Final (1986); ROD (1986); Monitoring and Evaluation Report (1989); Forest Planning Update (1989 and 1991); Wild & Scenic River Study (No Date).

Mapped Constraint Areas

WILDERNESS AREAS

Absaroka-Beartooth
Medicine Lake
UL Bend

WILDERNESS STUDY AREAS

Antelope Creek
Bighorn Tackon
Billy Creek
Bitter Creek
Bridge Coulee
Buffalo Creek
Burnt Lodge
Burnt Timber Canyon
Cow Creek
Dog Creek South
Ervin Ridge
Musselshell Breaks
Pryor Mountain
Seven Blackfoot
Stafford
Terry Badlands East
Terry Badlands West
Twin Coulee
Woodhawk
Zook Creek

INDIAN LANDS

Crow
Fort Belknap

EASTERN MONTANA *(continued)*

Fort Peck
Northern Cheyenne
Rocky Boys

NATIONAL WILDLIFE REFUGES
Black Coulee
Bowdoin
Charles M. Russell
Creedman Coulee
Hailstone
Halfbreed Lake
Hewitt Lake
Lake Mason
Lake Thibadeau
Lamesteer
Medicine Lake
UL Bend
War Horse

WILD & SCENIC RIVERS
Flathead River
  North Fork
  Middle Fork
  South Fork
Missouri River

OTHER FEDERAL LANDS
Bighorn Canyon National Recreation Area
Custer Battlefield National Monument

STATE DESIGNATED LANDS
Makoshika State Park

WESTERN MONTANA

Base Map

USGS 1:500,000 Scale Series, State of Montana Map, West Half, 1983

Constraint Area Data Sources

WILDERNESS AREAS
Bureau of Land Management State of Montana Wilderness Status Map, 1986
USGS National Wilderness Preservation Systems Map, 1987

WILDERNESS STUDY AREAS
Bureau of Land Management State of Montana Wilderness Status Map, 1986

INDIAN LANDS
Bureau of Indian Affairs "Indian Lands 1989" Map
Bureau of Land Management State of Montana Wilderness Status Map, 1986
USGS 1:500,000 Scale Series, State of Montana Map, West Half, 1983

NATIONAL PARKS
USGS 1:500,000 Scale Series, State of Montana Map, West Half, 1983

NATIONAL WILDLIFE REFUGES
Bureau of Land Management State of Montana Wilderness Status Map, 1986
USGS 1:500,000 Scale Series, State of Montana Map, West Half, 1983

WILD & SCENIC RIVERS
National Park Service Wild & Scenic Rivers Act through December 1990

MILITARY USE AREAS
Bureau of Land Management State of Montana Wilderness Status Map, 1986
USGS 1:500,000 Scale Series, State of Montana Map, West Half, 1983

OTHER FEDERAL LANDS
USGS 1:500,000 Scale Series, State of Montana Map, West Half, 1983

STATE DESIGNATED LANDS
American Automobile Association State Road Maps
USGS 1:500,000 Scale Series, State of Montana Map, West Half, 1983

Federal Planning Documents Reviewed

BUREAU OF LAND MANAGEMENT
Access-Supplement to State Director, Guidance for Resource Management Planning in Montana and the Dakotas (1989).
Bannack Scenic Withdrawal–Final EA (1978).
Bear Trap Canyon Wilderness Instant Study Area Suitability Report and Draft EIS (1980).
Billings Resource Area – RMP Final EIS (1983); Final Wilderness EIS (1988).
Centennial Mountains Wilderness–Suitability Study/MFP Amendment/Final EIS (1990).
Dillon Resource Area – MFP Summary (1979); Wilderness Final EIS (1987).
Garnet Resource Area – Draft EIS (1984); Final EIS (1985); RMP Summary (1986); Final Wilderness EIS (1990).

Headwaters Resource Area – Draft EIS (1983); Final Wilderness EIS (1986).

Humbug Spires Wilderness – Instant Study Area, Draft Suitability Report and EIS (1980); Final Suitability Study and EIS (1984); Interim Management Policy and Guidelines for Lands under Wilderness Review (1987).

Judith Valley Phillips – Draft EIS (1991); RMP/EIS (1991).

Lee Metcalf Wilderness Final Wilderness Management Plan (1984).

Sleeping Giant and Sheep Creek Wilderness Study/Final EIS (1991).

Upper Big Hole River Draft Management Plan (1985).

West HiLine – RMP Draft EIS (1987); RMP and Final EIS (1988); Record of Decision (ROD) (1988).

FOREST SERVICE

Beaverhead National Forest-Forest Plan (1986); Final EIS Vos. 1 and 2 (1986); ROD (1986).

Custer National Forest – Final EIS and Appendices (1986); Management Plan (1986); ROD (1987); Corridor Planning Information.

Deerlodge National Forest – Forest Plan (1987); Final EIS (1987); ROD (1987); Final EIS Appendices.

Flathead National Forest – Forest Plan (1985); ROD (1986); EIS Summary.

Gallatin National Forest – Forest Plan (No Date); Final EIS; ROD (1987).

Helena National Forest – Forest Plan (1986); Final EIS and Appendices (1986); ROD (1986).

Kootenai National Forest – Forest Plan Vos. 1 and 2 (1987); Final EIS Vos. 1 and 2 and Appendices (1987); ROD (1987).

Lewis and Clark National Forest – Draft Forest Plan (1986); Final EIS Vos. 1 and 2 (No Date); Final EIS Appendices (No Date); Overview Final (1986); ROD (1986); Monitoring and Evaluation Report (1989); Forest Planning Update (1989 and 1991); Wild & Scenic River Study (No Date).

Lolo National Forest-Draft Plan (1986); Forest Plan (1986); Final EIS and Appendices (1986); ROD (1986).

Mapped Constraint Areas

WILDERNESS AREAS

Absaroka-Beartooth
Anaconda Pintler
Beartrap Canyon West Unit
Bob Marshall
Cabinet Mountains
Gates of the Mountains
Great Bear
Lee Metcalf
Mission Mountains
Rattlesnake
Red Rock Lakes
Scapegoat
Selway-Bitterroot
Welcome Creek

WILDERNESS STUDY AREAS

Axolotl Lakes
Bell/Limekiln Canyons
Black Sage
Blacktail Mountains
Centennial Mountains
East Fork Blacktail Deer Creek
Elk Horn
Farlin Creek
Glacier National Park
Henneberry Bridge
Hidden Pasture Creek
Hoodoo Mountain
Humbug Spires
Quigg West
Ruby Mountains
Sleeping Giant
Square Butte
Tobacco Root Tack-ons
Wales Creek
Yellowstone Island
Yellowstone

INDIAN LANDS

Blackfeet
Flathead
Rocky Boys

NATIONAL PARKS

Glacier
Yellowstone

WESTERN MONTANA *(continued)*

NATIONAL WILDLIFE REFUGES
Benton Lake
National Bison Range
Ninepipe
Pablo
Pishkun
Red Rock Lakes
Swan River
Willow Creek

WILD & SCENIC RIVERS
Flathead
  Middle Fork
  South Fork
Missouri

MILITARY USE AREAS
Fort William Henry Harrison
Malmstrom Air Force Base

STATE DESIGNATED LANDS
Clark Canyon State Recreation Area
Lewis and Clark Cavern State Park (SP)
Lost Creek SP

NEVADA

Study Participants

INDUSTRY
AT&T
Bonneville Power Administration
Idaho Power Company
Los Angeles Department of Water and Power
MCI Telecommunications Corporation
Nevada Power Company
Overton Power District
Sierra Pacific Power Company
Southern California Edison Company
Southwest Gas Corporation
US Sprint
Valley Electric Cooperative
Western Area Power Administration
Westpac

BUREAU OF LAND MANAGEMENT
Battle Mountain District
Carson City District
Elko District
Ely District
Las Vegas District
Winnemucca District

FOREST SERVICE
Humboldt National Forest (NF)
Toiyabe NF

Base Map

USGS 1:500,000 Scale Series – State of Nevada, 1984

Constraint Area Data Sources

WILDERNESS AREAS
Bureau of Land Management State of Nevada Wilderness Status Map, 1986
Nevada Wilderness Protection Act, 1989
USGS National Wilderness Preservation Systems Map, 1987

WILDERNESS STUDY AREAS
Bureau of Land Management State of Nevada Wilderness Status Map, 1986
Bureau of Land Management State of Nevada Wilderness Report, 1991

INDIAN LANDS
USGS 1:500,000 Scale Series-State of Nevada, 1984
Bureau of Land Management State of Nevada Wilderness Status Map, 1986
Bureau of Indian Affairs "Indian Lands 1989" Map

NATIONAL WILDLIFE REFUGES
Bureau of Land Management State of Nevada Wilderness Status Map, 1986
USGS 1:500,000 Scale Series-State of Nevada, 1984

NATIONAL CONSERVATION AREAS
USGS 1:500,000 Scale Series-State of Nevada, 1984
Bureau of Land Management, Red Rock Canyon NCA proposed/approved, 1990

NATIONAL PARKS
USGS 1:500,000 Scale Series-State of Nevada, 1984
Forest Service, Humboldt National Forest, Ely Ranger District (East Half), Nevada, 1990

OTHER FEDERAL LANDS
Bureau of Land Management State of Nevada Wilderness Status Map, 1986
USGS 1:500,000 Scale Series-State of Nevada, 1984

MILITARY USE AREAS

Bureau of Land Management State of Nevada Wilderness Status Map, 1986

USGS 1:500,000 Scale Series – State of Nevada, 1984

STATE DESIGNATED LANDS

American Automobile Association State Road Maps

USGS 1:500,000 Scale Series-State of Nevada, 1984

Federal Planning Documents

BUREAU OF LAND MANAGEMENT

Egan Resource Area-Draft RMP and EIS (No Date); Proposed RMP and Final EIS (1984); Record of Decision (ROD) (1987).

Elko Resource Area – Proposed RMP and Final EIS (1986).

Schell Resource Area – MFP (selected pages) (1983).

Wells Resource Area – RMP Draft EIS (1983).

FOREST SERVICE

Humboldt National Forest – LRMP and Appendices (No Date); Final EIS (No Date); ROD (1986); LRMP Amendment No. 1 (1990).

Lahontan National Forest – Proposed RMP and Final EIS (No Date); RMP and EIS (No Date).

Toiyabe National Forest – ROD (1986); LRMP Overview (No Date).

Mapped Constraint Areas

WILDERNESS AREAS

Alta Toquima
Arc Dome
Boundary Peak
Currant Mountain
East Humboldt
Grant Range
Jarbidge
Mount Rose
Mount Charleston
Mount Moriah
Quinn Canyon
Ruby Mountains
Santa Rosa-Paradise Peak
Table Mountain

WILDERNESS STUDY AREAS

Alder Creek
Antelope Range
Arrow Canyon Range
Augusta Mountains
Bad Lands
Black Rock Desert
Blue Lakes
Blue Eagle
Bluebell
Buffalo Hills
Burbank Canyons
Calico Mountains
Cedar Ridge
Charles Sheldon Antelope Range
China Mountain
Clan Alpine Mountains
Clover Mountains
Death Valley NM NPN12
Delamar Mountains
Desatoya Mountains
Desert National Wildlife Range
Devil's Corral Disaster Peak
Dry Valley Rim
East Fork High Rock Canyon
El Dorado
Evergreen
Fandango
Far South Egans
Fish and Wildlife #1
Fish and Wildlife #2
Fish and Wildlife #3
Five Springs
Fortification Range
Fox Range
Gabbs Valley Range
Garret Buttes
Goshute Canyon
Goshute Peak
Granite Springs
Grapevine Mountains
High Rock Canyon
High Rock Lake
Ireteba Peaks
Job Peak
Jumbo Springs
Kawich
LaMadre Mountains
Lime Canyon

NEVADA *(continued)*

Little High Rock Canyon
Little Humboldt River
Massacre Rim
Meadow Valley Mountains
Million Hills
Morey Peak
Mormon Mountains
Mount Stirling
Mt. Grafton
Mt. Limbo
Muddy Mountains
Nellis
North Black Rock Range
North Fork of the Little Humboldt River
North Jackson Mountains
North McCullough Range
Owyhee Canyon
Pahute Peak
Palisade Mesa
Park Range
Parsnip Peak
Pigeon Spring
Pine Creek
Pole Creek
Poodle Mountain
Pueblo Mountains
Quail Spring
Queer Mountain
Rawhide Mountain
Red Spring
Resting Springs
Riordan's Well
Roberts Mountain
Rough Hills
Selenite Mountains
Sheldon National Antelope Refuge
Sheldon Contiguous
Silver Peak Range
Simpson Park
South Egan Range
South McCullough Range
South Pequop
South Jackson Mountains
South Reveille
South Pahroc
Stillwater Range
Table Mountain
The Wall
Tobin Range
Tunnel Spring
Twin Peaks
Wall Canyon
Weepah Spring
White Rock Range
Worthington Mountains
Yellow Rock Canyon

INDIAN LANDS

Duck Valley
Duckwater
Fallon
Fort McDermitt
Goshute
Las Vegas Paiute
Moapa River
Odgers Ranch
Pyramid Lake
South Fork
Stewart Ranch
Summit Lake
Walker River
Washoe/Dresslerville
Yerington
Yomba

NATIONAL WILDLIFE REFUGES

Anaho Island
Charles Sheldon Antelope Range
Desert Game Range
Fallon
Pahranagat
Ruby Lake
Sheldon National Antelope Refuge
Stillwater

NATIONAL CONSERVATION AREAS

Red Rock Canyon

NATIONAL PARKS

Great Basin

OTHER FEDERAL LANDS

Death Valley National Monument
Lake Mead National Recreation Area
Leabman Caves

MILITARY USE AREAS

Fallon Auxilliary Naval Air Station
Hawthorne Ammunition Depot
Indian Springs Air Force Auxilliary Field (AFAF)
Nellis Air Force Range

Nevada Test Site
US Naval Reserve
Wendover AFAF

STATE DESIGNATED LANDS
Cathedral Gorge State Park (SP)
Cave Lake State Recreation Area (SRA)
Echo Canyon Reservoir SRA
Floyd R. Lamb SP
Lahontan SRA
Lake Tahoe SP
Rye Patch SRA
Valley of Fire SP
Washoe Lake SP

NEW MEXICO

Study Participants

INDUSTRY
Arizona Public Service Company
AT&T
El Paso Electric Company
El Paso Natural Gas Company
MCI Telecommunications Corporation
Northwest Pipeline Corporation
Public Service Company of New Mexico
Salt River Project
Shell Pipeline Company
US Sprint
US WEST Communications
Western Area Power Administration

BUREAU OF LAND MANAGEMENT
Albuquerque District
Las Cruces District
Roswell District

FOREST SERVICE
Carson National Forest (NF)
Cibola NF
Gila NF
Lincoln NF
Santa Fe NF

Base Map

USGS 1:500,000 Scale Series, State of New Mexico, 1985

Constraint Area Data Sources

WILDERNESS AREAS
Bureau of Land Management State of New Mexico Wilderness Status Map, 1989
USGS National Wilderness Preservation Systems Map, 1987

WILDERNESS STUDY AREAS
Bureau of Land Management State of New Mexico Wilderness Status Map, 1989

INDIAN LANDS
Bureau of Indian Affairs "Indian Lands 1989" Map
Bureau of Land Management State of New Mexico Wilderness Status Map, 1989
USGS 1:500,000 Scale Series, State of New Mexico Map, 1985

NATIONAL PARKS
USGS 1:500,000 Scale Series, State of New Mexico Map, 1985

NATIONAL CONSERVATION AREAS
USGS 1:500,000 Scale Series, State of New Mexico Map, 1985

NATIONAL WILDLIFE REFUGES
Bureau of Land Management State of New Mexico Wilderness Status Map, 1989
USGS 1:500,000 Scale Series, State of New Mexico Map, 1985

WILD & SCENIC RIVERS
Bureau of Land Management State of New Mexico Wilderness Status Map, 1989
National Park Service Wild & Scenic Rivers Act, through December 1990

MILITARY USE AREAS
Bureau of Land Management State of New Mexico Wilderness Status Map, 1989
USGS 1:500,000 Scale Series, State of New Mexico Map, 1985

OTHER FEDERAL LANDS
USGS 1:500,000 Scale Series, State of New Mexico Map, 1985

STATE DESIGNATED LANDS
American Automobile Association State Road Maps
USGS 1:500,000 Scale Series, State of New Mexico Map, 1985

Federal Planning Documents Reviewed

BUREAU OF LAND MANAGEMENT
Carlsbad Resource Area – RMP Draft EIS (1986); RMP Final EIS (1986); RMP (1988).
Farmington Resource Area – RMP (1988).

Las Cruces District – LRMP/Draft EIS (1991).
Mimbres Resource Area – Proposed RMP Draft EIS (1992).
Rio Puerco Resource Area – RMP and Record of Decision (ROD) (1986); Rights of Way Alternatives B and D.
Socorro Resource Area – RMP (1989); Right of Way Avoidance Area Plan (1991).
Taos Resource Area – RMP (1988).
White Sands Resource Area – RMP (1986).

FOREST SERVICE

Carson National Forest – Transportation System and Utilities Corridors (1984); Draft Plan (1986).
Cibola National Forest – LRMP (1985); LRMP EIS (1985); EIS Summary (1985); Draft EIS Public Comments (1985); LRMP Proposed Amendment (1986).
Gila National Forest – Transportation System and Utilities Corridors (1985).
Lincoln National Forest – Proposed Forest Plan (1985).
Santa Fe National Forest – Proposed Forest Plan (1986); Revised Draft EIS (1986); LRMP EIS (1987); Public Comments on the Revised Draft EIS Vos. I, II, III (No Date); Forest Plan Summary (1987); Forest Plan (1988); Annual Report Fiscal Year 1988; EIS Summary (1989); Environmental Analysis Status Report (1991).

Mapped Constraint Areas

WILDERNESS AREAS

Aldo Leopold
Apache Kid
Bandelier
Bisti
Blue Range
Bosque del Apache
Chupadera Unit
Indian Well Unit
San Pasqual Unit
Capitan Mountains
Carlsbad (Caverns)
Cebolla
Chama River Canyon
Cruces Basin
De-na-zin
Dome
Gila
Latir Peak
Manzano
Pecos
Salt Creek
San Pascual
San Pedro Parks
Sandia
West Malpais
Wheeler Peak
White Mountain
Withington

WILDERNESS STUDY AREAS

Aden Lava Flow
Ah-shi-sle-pah
Alamo Hueco Mountains
Antelope
Apache Box
Big Hatchet Mountains
Blue Creek
Brokeoff Mountains
Bunk Robinson
Cabezon
Cedar Mountains
Chain of Craters
Chamisa
Columbine Hondo
Continental Divide
Cooke's Range
Cowboy Spring
Culp Canyon
Devil's Backbone
Devils Den Canyon
Eagle Peak
Empedrado
Florida Mountains
Gila Lower Box
Guadalupe Escarpment
Guadalupe Canyon
Hell Hole
Horse Mountain
Ignacio Chavez
Jornada del Muerto
La Lena
Las Uvas Mountains
Little Black Peak/Carrizizozo Lava Flow
Lonesome Ridge
Lower San Francisco
Manzano
Mathers

McKittrick Canyon
Mesita Blanca
Mudgetts
Ojito
Organ Mountains
Peloncillo Mountains
Petaca Pinta
Presilla
Rio Chama
Robledo Mountains
Sabinoso
San Antonio
Sierra De Las Canas
Sierra Ladrones
Stallion
Veranito
West Potrillo Mountains/Mount Riley
Whitmire Canyon

INDIAN LANDS
Acoma
Alamo Band Navajo (Puertocito)
Canoncito
Cochiti
Isleta
Jemez
Jicarilla Apache
Laguna
Mescalero
Nambe
Navajo (northern New Mexico)
Navajo (western New Mexico)
Picuris
Pojoaque
Ramah
San Felipe
San Ildefonso
San Juan
Sandia
Santa Ana
Santa Clara
Santo Domingo
Taos
Tesuque
Ute Mountain
Zia
Zuni

NATIONAL PARKS
Carlsbad Caverns National Park
Chaco Culture National Historic Park

NATIONAL CONSERVATION AREAS
El Malpais

NATIONAL WILDLIFE REFUGES
Bitter Lake
Bosque Del Apache
Grulla
Las Vegas
Maxwell
San Andres
Sevilleta

WILD & SCENIC RIVERS
Jemez River
Pecos River
Rio Chama River
Rio Grande River

MILITARY USE AREAS
Cannon Air Force Base (AFB)
Fort Bliss (McGregor Range)
Fort Wingate Depot Activity
Holloman AFB
Melrose Bombing Range
NASA Test Facility
Sandia Military Reserve
White Sands Missile Range

OTHER FEDERAL LANDS
Bandelier National Monument (NM)
Capulin Mountain NM
El Morro NM
Fort Union NM
Gila Cliff Dwellings NM
Gran Quivira NM
Pecos NM
White Sands NM

STATE DESIGNATED LANDS
Angel Peak State Recreation Area (SRA)
Bluewater State Park (SP)
Bottomless Lakes SP
Caballo Lake SP
Chicosa Lake SP
City Rocks SP
Conchas Lake SP
Elephant Butte Lake SP
Heron Lake SP
Living Desert SP
Navajo Lake SP
Rock Hound SP
Sumner Lake SP
Ute Lake SP
Valley of Fires SP
Villanueva SP

OREGON

Study Participants

INDUSTRY
AT&T
Bonneville Power Administration
Chevron Pipeline Company
CP National Corporation
GTE
Idaho Power Company
MCI Telecommunications Corporation
Northwest Pipeline Corporation
Olympic Pipeline Company
Pacific Bell
Pacific Gas and Electric Company
Pacific Gas Transmission Company
Pacific Power and Light Company
Santa Fe Pacific Pipeline Company
Sierra Pacific Power Company
Portland General Electric Company
US Sprint
US WEST Communications

BUREAU OF LAND MANAGEMENT
Burns District
Coos Bay District
Eugene District
Lakeview District
Medford District
Prineville District
Roseburg District
Salem District
Vale District

FOREST SERVICE
Deschutes National Forest (NF)
Fremont NF
Malheur NF
Mount Hood NF
Ochoco NF
Rogue River NF
Siskiyou NF
Siuslaw NF
Umatilla NF
Umpqua NF
Wallowa-Whitman NF
Willamette NF
Winema NF

Base Map

USGS 1:500,000 Scale Series, State of Oregon Map, 1982

Constraint Area Data Sources

WILDERNESS AREAS
Bureau of Land Management State of Oregon Wilderness Status Map, 1986
USDA Forest Service Willamette National Forest (South Half) Visitor Map, Oregon, 1990
USGS National Wilderness Preservation Systems Map, 1987

WILDERNESS STUDY AREAS
Bureau of Land Management State Wilderness Status Map

INDIAN LANDS
Bureau of Indian Affairs "Indian Lands 1989" Map
Bureau of Land Management State of Oregon Wilderness Status Map, 1986
USGS 1:500,000 Scale Series, State of Oregon Map, 1982

NATIONAL PARKS
USGS 1:500,000 Scale Series, State of Oregon Map, 1982

NATIONAL WILDLIFE REFUGES
Bureau of Land Management State of Oregon Wilderness Status Map, 1986
USGS 1:500,000 Scale Series, State of Oregon Map, 1982

WILD & SCENIC RIVERS
Bonneville Power Administration, Federal Wild & Scenic Rivers of Oregon, 1988
Bureau of Land Management, Oregon State Office, Omnibus Oregon Wild & Scenic Rivers Act, 1988
Bureau of Land Management, Oregon State Office, Western Oregon Special Management Areas, 1985
National Park Service Wild & Scenic Rivers Act, through December 1990

MILITARY USE AREAS
Bureau of Land Management State of Oregon Wilderness Status Map, 1986
USGS 1:500,000 Scale Series, State of Oregon Map, 1982

OTHER FEDERAL LANDS
Bureau of Land Management State of Oregon Wilderness Status Map, 1986
USGS 1:500,000 Scale Series-State of Oregon, 1982

STATE DESIGNATED LANDS

American Automobile Association State Road Maps

USGS 1:500,000 Scale Series-State of Oregon, 1982

Bureau of Land Management, Oregon State Office, Central Oregon Public Lands, 1986

Federal Planning Documents Reviewed

BUREAU OF LAND MANAGEMENT

Andrews Resource Area – Land Use Plan Proposed Actions (1982).

Annual Status Report for Areas of Critical Environmental Concern (1990).

Baker Resource Area – RMP Draft EIS (1986); RMP and Final EIS (1986); Record of Decision (ROD) (1989).

Brothers/LaPine Resource Area – RMP ROD and Rangeland Program Summary (1989).

Coos Bay District – RMP Summary of the Analysis of the Management Situation (1991).

Eugene District Office – RMP Summary of the Analysis of the Management Situation (1991).

John Day Resource Management Plan – ROD and Rangeland Program Summary (1985).

Klammath Falls Resource Area – RMP Summary of the Analysis of the Management Situation (1990).

Medford District Office – RMP Summary of the Analysis of the Management Situation (1991).

Oregon Wilderness – Draft EIS (1985); Supplement to Draft EIS Vos. I and II (1987).

Roseburg District Office – RMP Summary of the Analysis of the Management Situation (1991).

Salem District Office – RMP Summary of the Analysis of the Management Situation (1991).

Three Rivers Resource Area – RMP and EIS Vos I and II (1989).

Two Rivers Resource Area – Draft EIS (1985); Proposed RMP Final EIS (1985); ROD and Rangeland Program Summary (1986).

Vale District – ROD (No Date).

Warner Lakes Plan Amendment for Wetlands and Associated Uplands – Plan Amendment and EA for Framework Plan (1988); Plan Amendment and EA and ROD (1989)

Wilderness Studies – Management Framework Plan Amendments Summary of Land Use Alternatives (1982).

FOREST SERVICE

Baker National Forest – Proposed LRMP/ Final EIS (1986).

Columbia River Gorge National Scenic Area – Final Draft Management Plan for General and Special Management Areas (1991).

Deschutes National Forest – LRMP (1990); Final EIS and Appendices (1990); ROD (1990); Final EIS Summary (1990).

Malheur National Forest – LRMP (1990); ROD (1990); Final EIS Summary (1990).

Management for the Northern Spotted Owl in the National Forests – Draft EIS Summary (No Date).

Mount Hood National Forest – LRMP (1990).

Ochoco National Forest/Crooked River National Grassland – Proposed LRMP (1986); Draft EIS and Appendices (1986); LRMP (1989); Final EIS and Appendices (1989); ROD (1989).

Rogue River National Forest – LRMP (1990); Final EIS (1990); ROD (1990); Appendices.

Siskiyou National Forest – LRMP (1989); Final EIS and Appendices (1989); ROD (1989); Planning Report (No Date).

Siuslaw National Forest – LRMP (1990); Final EIS, Appendices and Summary (1990); ROD (1990); Forest Plan Implementation and Monitoring Report (1991);

Umatilla National Forest – LRMP (1990); Final EIS and Appendices (1990); ROD (1990); Forest Plan Monitoring and Evaluation Report (1991).

Umpqua National Forest – LRMP (1990); Final EIS and Appendices (1990); ROD (1990).

Wallowa/Whitman National Forest – LRMP (1990); Final EIS and Appendices (1990); ROD (1990).

Willamette National Forest – LRMP (1990); Final EIS and Appendices (1990); ROD (1990); Monitoring and Evaluation Report (1991).

Winema National Forest – LRMP (1990); Final EIS (1990); ROD (1990); Appendices; Utilities/Transportation Corridors Sheet.

OREGON *(continued)*

Mapped Constraint Areas

WILDERNESS AREAS

Badger Creek
Black Canyon
Boulder Creek
Bridge Creek
Bull of the Woods
Columbia
Cummins Creek
Diamond Peak
Drift Creek
Eagle Gap
Gearhart Mountain
Grassy Knob
Hells Canyon
Kalmiopsis
Menagerie
Middle Santiam
Mill Creek
Monument Rock
Mount Hood
Mount Thielsen
Mount Jefferson
Mount Washington
Mountain Lakes
North Fork Umatilla
Red Buttes
Rock Creek
Roque Umpqua Divide
Salmon Huckleberry
Sky Lakes
Strawberry Mountain
Table Rock
Three Sisters
Waldo Lake
Wenaha-Tucannon
Wild Rogue

WILDERNESS STUDY AREAS

Abert Rim
Aldrich Mountain
Alvord Peak
Alvord Desert
Badlands
Basque Hills
Beaver Dam Creek
Blitzen River
Blue Canyon
Bowden Hills
Bridge Creek
Camp Creek
Castle Rock
Cedar Mountain
Clarks Butte
Cottonwood Creek
Cougar Well
Crater Lake NP 910
Devils Garden Lava Bed
Diablo Mountain
Disaster Peak
Dry Creek
Dry Creek Buttes
East Alvord
Fifteen Mile Creek
Fish Creek Rim
Four Craters Lava Bed
Gerry Mountain
Gold Creek
Guano Creek
Hampton Butte
Hart Mountain NWR 900
Hawk Mountain
Heath Lake
High Steens
Home Creek
Homestead
Honeycombs
Indian Creek
Jordan Craters
Little Blitzen Gorge
Lookout Butte
Lower John Day
Lower Owyhee Canyon
Lower Stonehouse
Mahogany Ridge
Malheur NWR 901
Malheur River-Bluebucket Creek
McGraw Creek
Mountain Lakes
North Fork
North Pole Ridge
Oregon Canyon
Orejana Canyon
Owyhee Breaks
Owyhee Canyon
Palomino Hills
Pine Creek

Pueblo Mountains
Red Mountain
Rincon
Saddle Butte
Sage Hen Hills
Sand Dunes
Sandy Hollow
Sheep Gulch
Sheep Mountain
Sheepshead Mountains
Slocum Creek
Soda Mountain
South Fork
South Fork of the Donner and Blitzen River
Spaulding
Sperry Creek
Spring Basin
Squaw Ridge Lava Bed
Steelhead Falls
Stonehouse
Table Mountain
Thirtymile
Twelve Mile Creek
Upper Leslie Gulch
Upper West Little Owyhee
West Peak
Wild Horse Basin
Wildcat Canyon
Willow Creek
Winter Range
6099 (Olallie)
6321 (near Warm Springs IR)
6248 (Pine Creek)

INDIAN LANDS
Burns Paiute
Fort McDermitt
Grand Ronde
Siletz
Umatilla
Warm Springs

NATIONAL PARKS
Crater Lake

NATIONAL WILDLIFE REFUGES
Ankeny
Baskett Slough
Bear Valley
Cold Springs
Columbian White Tailed Deer
Deer Flat
Hart Mountain National Antelope Refuge
Klamath Forest
Lewis and Clark
Lower Klamath
Malheur
McKay Creek
Sheldon
Umatilla
Upper Klamath
William L. Finley

WILD & SCENIC RIVERS
Big Marsh Creek
Chetco
Clackamas
Crescent Creek
Crooked
  North Fork
Deschutes
Donner and Blitzen
Eagle Creek
Elk
Grande Ronde
Illinois
Imnaha
John Day
  North Fork
  South Fork
Joseph Creek
Little Deschutes
Lostine
Malheur
  North Fork
McKenzie
Metolius
Minam
North Powder
North Umpqua
Owyhee
  North Fork
Pwujee Rober
Powder
Quartzville Creek
Roaring
Rogue
Salmon
Sandy
Smith
  North Fork
Snake

OREGON *(continued)*

Sprague
North Fork
Squaw Creek
Sycan
Upper Rogue
Wenaha
West Little Owyhee
White
Willamette
North Fork of the Middle Fork

MILITARY USE AREAS
Camp Rilea Military Reserve
Umatilla Army Depot
US Military Reserve

OTHER FEDERAL LANDS
Columbia River Gorge National Scenice Area
Hells Canyon National Recreation Area (NRA)
John Day Fossil Beds National Monument
Oregon Dunes NRA

STATE DESIGNATED LANDS
Bandon State Park (SP)
Bristow SP
Bullards State Beach (SB)
Cape Blanco SP
Cape Lookout SP
Champoes SP
Deschutes River Recreational Lands
Devil's Elbow SP
Ecola SP
Floras Lake SP
Fort Stevens SP
Hat Rock SP
Honeyman Memorial SP
Humbug Mountain SP
La Pine State Recreation Area (SRA)
Lake Owyee SP
Mayer SP
Milo McIver SP
Molalla River SP
Mount Pasgah SP
Nehalem SP
Nestucca Spit SP
Oswald West SP
Saddle Mountain SP
Seneca Fouts Memorial SP
Shepperds Dell SP
Shore Acres SP
Silver Falls SP
Smith Rock SP
Stewart SP
Succor Creek SRA
Sunset Bay SP
The Cove Palisades SP
Tryon Creek SP
Tugman SP
Umpqua Lighthouse SP
Washburne Memorial SP
Willamette Mission SP
Wygant SP

UTAH

Study Participants

INDUSTRY
Amoco Pipeline Company
AT&T
Conoco
Deseret Generation & Transmission Company
Los Angeles Department of Water and Power
MCI Telecommunications Corporation
Northwest Pipeline Corporation
Questar Pipeline Company
US Sprint
US WEST Communications
Utah Power & Light Company

BUREAU OF LAND MANAGEMENT
Arizona Strip District
Cedar City District
Moab District
Richfield District
Salt Lake City District
Vernal District

FOREST SERVICE
Ashley National Forest (NF)
Dixie NF
Fishlake NF
Manti-LaSal NF
Uinta NF
Wasatch-Cache NF

Base Map

USGS 1:500,000 Scale Series, State of Utah Map, 1988

Constraint Area Data Sources

WILDERNESS AREAS

Bureau of Land Management State of Utah Wilderness Status Map, 1986

USGS National Wilderness Preservation Systems Map, 1987

WILDERNESS STUDY AREAS

Bureau of Land Management State of Utah Wilderness Status Map, 1986

INDIAN LANDS

Bureau of Indian Affairs "Indian Lands 1989" Map

Bureau of Land Management State of Utah Wilderness Status Map, 1986

USGS 1:500,000 Scale Series, State of Utah Map, 1988

NATIONAL PARKS

USGS 1:500,000 Scale Series, State of Utah Map, 1988

NATIONAL WILDLIFE REFUGES

Bureau of Land Management State of Utah Wilderness Status Map, 1986

USGS 1:500,000 Scale Series, State of Utah Map, 1988

MILITARY USE AREAS

Bureau of Land Management State of Utah Wilderness Status Map, 1986

USGS 1:500,000 Scale Series, State of Utah Map, 1988

OTHER FEDERAL LANDS

Bureau of Land Management State of Utah Wilderness Status Map, 1986

USGS 1:500,000 Scale Series, State of Utah Map, 1988

STATE DESIGNATED LANDS

American Automobile Association State Road Maps

USGS 1:500,000 Scale Series, State of Utah Map, 1988

Federal Planning Documents Reviewed

BUREAU OF LAND MANAGEMENT

Book Cliffs Resource Area – Record of Decision (ROD) and Rangeland Program Summary (1985).

Box Elder – ROD and Rangeland Program Summary (1986).

Cedar Beaver Garfield Antimony – ROD and RMP (1986).

Grand Resource Area – RMP (1985).

House Range Resource Area – RMP and ROD (1987).

Pony Express – ROD (1990).

San Juan Resource Area – RMP Draft EIS (1986); ROD and Rangeland Program Summary (1991).

San Rafael Resource Area – Final RMP (1991).

Warm Springs Resource Area – RMP, ROD, and Rangeland Program Summary (1987).

FOREST SERVICE

Dixie National Forest – LRMP; Final EIS; ROD (1986); Final EIS Summary (No Date); Final EIS Appendices; Revised Appendix D of the LRMP (1986); Utility Corridor/ Window Evaluation (1986).

Fishlake National Forest – LRMP Draft EIS (1982); Proposed LRMP (No Date); LRMP and Draft EIS Summary (1985); Energy, Transportation, and Utility Corridor Evaluation.

Manti-LaSal National Forest – LRMP (No Date); Final EIS (No Date).

Uinta National Forest – LRMP (No Date).

Wasatch-Cache National Forest – LRMP Appendices (No Date).

Mapped Constraint Areas

WILDERNESS AREAS

Ashdown Gorge
Beaver Dam Mountains
Box-Death Hollow
Dark Canyon (Dark-Woodenshoe Canyon)
Deseret Peak
High Uintas
Lone Peak
Mount Naomi
Mount Nebo
Mount Olympus
Mount Timpanogos
Paria Canyon-Vermilion Cliffs
Pine Valley Mountain
Twin Peaks
Wellsville Mountain

WILDERNESS STUDY AREAS

Arches NP 900
Behind the Rocks

UTAH *(continued)*

Bridger Jack Mesa
Bryce Canyon NP 903
Bull Canyon
Bull Mountain
Bullet Canyon
Burning Hills
Butler Wash
Canaan Mountain
Canyonlands NP 905
Capitol Reef NP 906
Carcass Canyon
Cedar Breaks NM 908
Cedar Mountains
Cheese Box Canyon
Coal Canyon
Conger Mountain
Cottonwood Canyon
Cougar Canyon
Crack Canyon
Cross Canyon
Daniels Canyon
Dark Canyon
Death Ridge
Deep Creek
Deep Creek Mountains
Desolation Canyon
Devils Canyon
Devils Garden
Diamond Breaks
Dinosaur NM 913
Dirty Devil
Escalante Canyon (Tract 1)
Fiddler Butte
Fifty Mile Mountain
Fish Creek Canyon
Fish Springs Range
Floy Canyon
Flume Canyon
Fremont Gorge
French Springs-Happy Canyon
Glen Canyon NRA
Grand Gulch
Horseshoe Canyon (North)
Horseshoe Canyon (South)
Howell Peak
Indian Creek
Jack Canyon
Joshua Tree
King Top
La Verkin Creek
Link Flats
Little Rockies
Lost Spring Canyon
Mancos Mesa
Mexican Mountain
Middle Point
Mill Creek Canyon
Moquith Mountain
Mount Ellen-Blue Hills
Mount Hillers
Mount Pennel
Mud Spring Canyon
Muddy Creek
Mule Canyon
Negro Bill Canyon
North Escalante Canyon
North Fork Virgin River
North Stansbury Mountains
Notch Peak
Oderville Canyon
Paria-Hackberry
Parunuweap Canyon
Phipps Death Hollow
Pine Canyon
Red Butte
Red Mountain
Road Canyon
Rockwell
San Rafael Reef
Scorpion
Shieks Flat
Sids Mountain
Slickhorn Canyon
Spring Creek Canyon
Spruce Canyon
Squaw and Papoose Canyons
Steep Creek
Swasey Mountain
The Blues
The Cockscomb
The Gulch
The Watchman
Turtle Canyon
Wah Wah Mountains
Wahweap
West Cold Springs
Westwater Canyon

White Rock Range
Winter Ridge
Wrigley Mesa/Jones Canyon/Black Ridge Canyons West
Zion NP 930
020-001

INDIAN LANDS
Goshute
Navajo
Paiute
Shivwits
Skull Valley
Uintah and Ouray

NATIONAL PARKS
Arches
Canyonlands (2 parts)
Capitol Reef
Zion

NATIONAL WILDLIFE REFUGES
Bear River
Fish Springs
Ouray

MILITARY USE AREAS
Camp Williams State Military Reserve
Dugway Proving Ground
Hill Air Force Base
Little Mountain AF Training Annex
Tooele Army Depot
Utah Test and Training Range-North Area
Utah Test and Training Range-South Area
Utah Launch Complex White Sands Missile Range

OTHER FEDERAL LANDS
Bryce Canyon National Monument (NM)
Cedar Breaks NM
Dinosaur NM
Flaming Gorge National Recreation Area (NRA)
Glen Canyon NRA
Honvenweep NM
Natural Bridges NM (4 parts)

STATE DESIGNATED LANDS
Bonneville Salt Flats State Park (SP)
Camp Floyd SP
Coral Pink Sand Dunes SP
Danger Cave SP
Dead Horse Point SP
Deer Creek State Recreation Area SRA
East Canyon Lake State Recreation Area
Escalante Petrified Forest SP
Goblin Valley State Reserve (SR)
Great Salt Lake SP
Gunlock Lake SP
Kodachrome Basin SR
Lost Creek Lake State Beach
Rockport Lake SRA
Scofield Lake SRA
Snow Canyon SP
Starvation Lake SRA
Wasatch Mountain SP

WASHINGTON

Study Participants

INDUSTRY
AT&T
BC Hydro
Bonneville Power Administration
MCI Telecommunications Corporation
Northwest Pipeline Corporation
Olympic Pipeline Company
Pacific Gas Transmission Company
Pacific Power & Light Company
Puget Sound Power & Light Company
Seattle City Light
Snohomish Public Utilities District
US Sprint
US WEST Communications
Washington Water Power Company

BUREAU OF LAND MANAGEMENT
Spokane District

FOREST SERVICE
Colville National Forest (NF)
Gifford Pinchot NF
Mount Baker NF
Okanogan NF
Olympic NF
Snoqualmie NF
Wenatchee NF

Base Map

USGS 1:500,000 Scale Series, State of Washington Map, 1982

WASHINGTON *(continued)*

Constraint Area Data Sources

WILDERNESS AREAS

Washington Department of Natural Resources, Washington State Public Lands Map, 1989

USGS National Wilderness Preservation Systems Map, 1987

INDIAN LANDS

Bureau of Indian Affairs "Indian Lands 1989" Map

USGS 1:500,000 Scale Series, State of Washington, 1982

Washington Department of Natural Resources, Washington State Public Lands Map, 1989

NATIONAL PARKS

USGS 1:500,000 Scale Series, State of Washington Map, 1982

Washington Department of Natural Resources, Washington State Public Lands Map, 1989

NATIONAL WILDLIFE REFUGES

USGS 1:500,000 Scale Series, State of Washington Map, 1982

MILITARY USE AREAS

USGS 1:500,000 Scale Series, State of Washington Map, 1982

WILD & SCENIC RIVERS

National Park Service Wild & Scenic Rivers Act, through December 1990

OTHER FEDERAL LANDS

USGS 1:500,000 Scale Series, State of Washington Map, 1982

STATE DESIGNATED LANDS

American Automobile Association State Road Maps

USGS 1:500,000 Scale Series, State of Washington Map, 1982

Washington Department of Natural Resources, Washington State Public Lands Map, 1989

Federal Planning Documents Reviewed

BUREAU OF LAND MANAGEMENT

Spokane District – RMP and Final EIS (1985); Record of Decision (ROD) and Rangeland Program Summary (1987).

FOREST SERVICE

Colville National Forest – LRMP (1988); Final EIS and Appendices (1988); ROD (1988).

Gifford Pinchot National Forest – LRMP (1990); Final EIS and Appendices (1990); ROD (1990); Pinchot Projects (1992).

Mount Baker-Snoqualmie National Forest – LRMP (1990); Final EIS (1990); ROD (1990); Transmission Right of Way Management Plan (1990).

Okanogan National Forest – LRMP (1989); Final EIS (1989); ROD (1989); Appendices.

Olympic National Forest – LRMP (1990); Final EIS and Appendices (1990); ROD (1990); Monitoring Report (1991); Forest Plan Report (1992).

Wenatchee National Forest – Proposed LRMP Draft EIS (1986); Draft EIS Correction and Supplemental Information (1986); Draft EIS Reviewer's Guide and Response Form (1986); LRMP (1990); Forest Plan Report (1990); Monitoring Report (1990).

Mapped Constraint Areas

WILDERNESS AREAS

Alpine Lakes
Boulder River
Buckhorn
Clearwater
Colonel Bob
Glacier Peak
Glacier View
Goat Rocks
Henry M. Jackson
Indian Heaven
Juniper Dunes
Lake Chelan-Sawtooth
Mount Adams
Mount Baker
Mount Skokomish
Noisy-Diobsud
Norse Peak
Pasayten
Salmo-Priest

Tatoosh
The Brothers
Trapper Creek
Wenaha Tucannon
William O. Douglas

INDIAN LANDS
Chehalis
Colville
Hoh
Kalispell
Lower Elwah
Lummi
Makah
Muckleshoot
Nisqually
Ozette
Port Madison
Port Gamble
Puyallup
Quileute
Quinault
Shoalwater Bay
Skokomish
Spokane
Squaxin Island
Swinomish
Tulalip
Yakima

NATIONAL PARKS
Mount Rainier
North Cascades
Olympic

NATIONAL WILDLIFE REFUGES
Columbia
Columbian White-tailed Deer
Conboy Lake
Dungenuss
Little Pend Oreille
Matia Island
McNary
Nisqually
Ridgefield
Saddle Mountain
San Juan
Smith Island
Toppenish
Turnbull
Umatilla
Willapa

WILD & SCENIC RIVERS
Cascade River
  South Fork
Klickitat River
Sauk River
  North Fork
Skagit River
Suiattle River
White Salmon River

MILITARY USE AREAS
Cusick Survival Training Site
Fairchild Air Force Base (AFB)
Fort Lewis Military Reserve
Larson AFB
McChord AFB
US Military Reserve-Yakima Firing Center
US Naval Reserve
Whidbey Island Naval Air Station

OTHER FEDERAL LANDS
Columbia River Gorge
Coulee Dam National Recreation Area (NRA)
Hanford Works
Lake Chelan NRA
Mount Baker NRA
Mount St. Helens National Volcanic
  Monument
Ross Lake NRA

STATE DESIGNATED LANDS
Anderson Lake State Park (SP)
Asotin State Wildlife Refuge Area (SWRA)
Banks Lake SWRA
Beacon Rock SP
Birch Bay SP
Blake Island Marine Park
Bridal Trails SP
Brooks Memorial SP
Central Ferry SWRA
Chief Joseph SWRA
Chiliwist SWRA
Colockum SWRA
Crab Creek SWRA
Crow Butte SP
Cypress Island SP
Deception Pass SP
Entiat SWRA
Fields Springs SP
Fort Canby SP
Fort Ebee SP
Fort Flager SP

WASHINGTON *(continued)*

Fort Worden SP
Ginkgo SP
Gloyd Seeps SWRA
Green River Gorge Conservation Area
Ike Kynswa SP
Indian Dam SWRA
Johns River SWRA
Joseph Whidbey SP
Klicktat SWRA
Lake Terrell SWRA
Lake Lenore SWRA
Lake Cushman SP
Larrabee SP
Leadbetter SP
Lewis and Clark SRA
Lt. Murray SWRA
Lyons Ferry SP
McNary SWRA
Methow SWRA
Millerslyvania SP
Mineral Springs SWRA
Moran SP
Mount Spokane SP
Northrup Canyon SP
Oak Creek SWRA
Olympic SWRA
Oyhut SWRA
Perrygin SP
Potholes SWRA
Quincy SWRA
Rattlesnake Slope SWRA
Riverside SP
Sacajawea SP
Scatter Creek SP
Schaake SWRA
Seep Lakes SWRA
Sherman Creek SWRA
Sinlahphin SWRA
Skagitt SWRA
Smith Creek SWRA
Squilchuck SP
Stratford SWRA
Sun Lakes SP
Sunnyside SWRA
Swakane SWRA
Townsend SP
Wahluke Slope SWRA
Winchester Wasteway SWRA
Wooten SWRA

WYOMING

Study Participants

INDUSTRY
AT&T
Northwest Pipeline Corporation
Pacific Power & Light Company
US Sprint
US WEST Communications
Western Area Power Administration

BUREAU OF LAND MANAGEMENT
Casper District
Rawlins District
Rock Springs District
Worland District

FOREST SERVICE
Bighorn National Forest (NF)
Bridger-Teton NF
Medicine Bow NF
Shoshone NF

Base Map

USGS 1:500,000 Scale Series, State of Wyoming Map, 1980

Constraint Area Data Sources

WILDERNESS AREAS
USGS National Wilderness Preservation Systems Map, 1980
Bureau of Land Management State of Wyoming Wilderness Status Map, 1986

WILDERNESS STUDY AREAS
Bureau of Land Management State of Wyoming Wilderness Status Map, 1986

INDIAN LANDS
Bureau of Indian Affairs "Indian Lands 1989" Map
Bureau of Land Management State of Wyoming Wilderness Status Map, 1986
USGS 1:500,000 Scale Series, State of Wyoming Map, 1980

NATIONAL PARKS
USGS 1:500,000 Scale Series, State of Wyoming Map, 1980

NATIONAL WILDLIFE REFUGES
Bureau of Land Management State of Wyoming Wilderness Status Map, 1986
USGS 1:500,000 Scale Series, State of Wyoming Map, 1980

WILD & SCENIC RIVERS

National Park Service Wild & Scenic Rivers Act, through December 1990

MILITARY USE AREAS

Bureau of Land Management State of Wyoming Wilderness Status Map, 1986

USGS 1:500,000 Scale Series, State of Wyoming Map, 1980

OTHER FEDERAL LANDS

Bureau of Land Management State of Wyoming Wilderness Status Map, 1986

USGS 1:500,000 Scale Series-State of Wyoming, 1980

STATE DESIGNATED LANDS

American Automobile Association State Road Maps

USGS 1:500,000 Scale Series, State of Wyoming Map, 1980

Federal Planning Documents Reviewed

BUREAU OF LAND MANAGEMENT

Buffalo Resource Area – RMP Draft EIS (1984); Final EIS (1985); RMP and Record of Decision (ROD) (1985) .

Green River Resource Area – Utility Corridor Map.

Kemmerer Resource Area – RMP and ROD (1986).

Pinedale Resource Area – RMP and ROD (1988).

Platte River Resource Area – RMP Draft EIS (1984).

Powder River Region – Draft EIS for Round II Coal Lease Sale (1984).

FOREST SERVICE

Medicine Bow National Forest and Thunder Basin National Grassland – LRMP (1985); Final EIS Vos 1 and 2 (1985); ROD (1985); LRMP Summary (1985); Preliminary Scoping Statement for EIS and ROD for an Amendment to the LRMP (1991).

WILDERNESS AREAS

Absaroka Beartooth
Bridger
Cloud Peak
Encampment
Fitzpatrick
Gros Ventre
Huston Park
Jedediah Smith
North Absaroka
Platte River
Popo Agie
Savage Run
Teton
Washakie
Winegar Hole

WILDERNESS STUDY AREAS

Adobe Town
Alkali Basin/East Sand Dunes
Alkali Creek
Alkali Draw
Bennett Mountain
Bobcat Draw Badlands
Buffalo Hump
Cedar Mountain
Copper Mountain
Devils Playground
Dubois Badlands
Encampment River Canyon
Ferris Mountain
Fortification Creek
Gardner Mountain
Grand Teton
High Lakes
Honeycombs
Honeycomb Buttes
Lake Mountain
McCullough Peaks
Medicine Lodge
North Fork
Oregon Buttes
Owl Creek
Palisades
Prospect Mountain
Raymond Mountains
Red Butte
Red Creek Badlands
Red Lake
Sand Dunes
Scab Creek
Sheep Mountain
Shoal Creek
South Pinnacles
Sweetwater Rocks
Sweetwater Canyon
Trapper Creek
Twin Buttes

WYOMING *(continued)*

Whiskey Mountain
Whitehorse Creek
Yellowstone

INDIAN LANDS
Wind River

NATIONAL PARKS
Grand Teton
Yellowstone

NATIONAL WILDLIFE REFUGES
Bamforth
Hutton Lake
National Elk Refuge
Pathfinder
Seedskadee

WILD & SCENIC RIVERS
Clarks Fork of the Yellowstone

MILITARY USE AREAS
Camp Guernsey Training Area
FE Warren Air Force Base
Naval Petroleum Reserve No. 3 (Teapot Dome)
Pole Mountain Military Reserve

OTHER FEDERAL LANDS
Bighorn Canyon National Recreation Area (NRA)
Devils Tower National Monument (NM)
Flaming Gorge NRA
Fossil Butte NM

STATE DESIGNATED LANDS
Boysen State Park (SP)
Buffalo Bill SP
Curt Gowdy SP
Glendo SP
Guernsey SP
Hot Springs SP
Keyhole SP

APPENDIX A

JOINT BUREAU OF LAND MANAGEMENT/ FOREST SERVICE PARTICIPATION MEMORANDUM

Department of the Interior

Bureau of Land Management
Washington, D.C. 20240

Department of Agriculture

Forest Service
Washington, D.C. 20013

IN REPLY REFER TO:
1920(760)

Memorandum

To: Bureau of Land Management State Directors
Regional Foresters (Regions 1-6)

From: Director, Bureau of Land Management
Chief, Forest Service

Subject: Western Utility Corridor Study

The Western Utilities Group (WUG), an ad hoc organization of major western gas, electric, and telecommunication companies, is initiating an update of its report on anticipated long-term needs for utility corridors across Federal lands. This report, the most recent of which was issued in 1986, is an effort to identify corridor needs so they can be effectively considered in Federal land management plans. The final report is scheduled for completion early in 1992.

On March 13, 1991, study project manager, Carl Barnett, and other representatives from WUG met with us in Washington to brief us on the objectives of the study, and on the study process and schedule. In the past we have had limited data available to incorporate utility corridor planning into our planning process. This effort will provide important information necessary to consider as we revise and amend plans to meet a broad spectrum of public needs.

The Washington Office is providing national coordination with WUG, but active participation and leadership in working with WUG is expected to occur at the regional, forest, State, and resource area levels. The Bureau of Land Management, the Forest Service and WUG contacts are shown on the attachment which outlines the study.

The WUG has hired the Michael Clayton and Associates consulting firm to conduct the study. Future study schedules will be coordinated with the contact persons you have assigned to this project.

Both of us are enthusiastic about the study and recognize the benefits that will be derived. We have agreed to support the study and provide what assistance and information we can to see the update successfully completed.

A J Jamison
BLM

F. Dale Robertson
Forest Service

1 Attachment
Attach. 1 - Western Regional Corridor Study (4 pgs)

APPENDIX B
FEDERAL LAND MANAGEMENT AGENCY QUESTIONNAIRE RESPONSE SUMMARY

This chapter presents a summary of Agency opinions and recommendations for the *Western Regional Corridor Study*. This information was received in response to a Questionnaire that was distributed to the Bureau of Land Management and Forest Service representatives throughout the 11 Western States. The purpose of the questionnaire was to identify information needed by the BLM and the Forest Service in order to better facilitate regional corridor planning, inform the Western Utility Group of the status of corridor planning in the West, and focus Agency attention on corridor planning issues throughout the federal land planning process.

The questionnaires were distributed following a series of Industry/Agency coordination meetings. These coordination meetings served to establish the lines of communication between the Agencies, local Industry representatives and *Study* consultants, and proved very valuable in ensuring a comprehensive and well-represented response by both Agencies at all levels.

A total of 89 questionnaire responses were received, representing 118 jurisdictions (a number of questionnaires provided agency plan status and designation status for multiple areas). This number represents a response level of approximately 80%, a remarkable rate that is directly attributable to the significant front-end efforts of the Western Utility Group and the Washington D.C. headquarters staff (Agency oversight committee members) of both the BLM and Forest Service.

Responses to the "yes" and "no" and "agree" or "disagree" oriented questions were consistent with the utility Industry's expectations. These responses also served to substantiate and document the Industry's belief that federal agency land planners are concerned with corridor planning and do recognize the significance of balancing resource values and other uses when planning for the future. Clearly, based on the responses received, the need for regional planning and a cooperative approach is overwhelmingly supported by the Agencies.

The balance of this chapter summarizes the results of several of the key issues addressed in the questionnaire, and provides the tabulated responses for each question.

CORRIDOR DEFINITION CONSISTENCY

The questionnaire responses demonstrate that the Industry corridor definition is generally consistent with the Agency definition. Just over half (54%) of the jurisdictions indicated general consistency and noted that, in most cases, the Agency definition typically indicates, or requires, a defined width.

PRIMARY PURPOSE OF A CORRIDOR

The most consistent response received indicated that the primary purpose of a corridor is to "define and consolidate rights of way and to minimize the impact on the environment". Additional statements included: 1) to restrict utilities to a defined location, and 2) to utilize existing transportation and transmission routes, serving as preferred routes.

CORRIDOR DESIGNATION

Just over half (51%) of the jurisdictions indicated that they "designate" both existing and planned corridors, and approximately one-third of the Management Plans designate both existing and planned corridors. The results of Question Number 5 (referring to "identify" vs. "formally designate" corridors) indicate that approximately two-thirds of the jurisdictions responding still only "identify" corridors in their Plans rather than formally designating them, while nearly 40% of the jurisdictions *do not* designate corridors in their current Management Plans.

Approximately 78% of the respondents indicated that the designation of corridors *would* expedite review and permitting procedures for new facilities located within existing corridors. In addition, almost two-thirds of the jurisdictions agreed that the designation of corridors, adopted as part of the federal land management plans, would serve to lessen (not entirely eliminate) the need to consider routing alternatives. Approximately 85% of the respondents indicated that designated corridors would encourage consolidation of separate rights of way and reduce potential environmental impacts. It was consistently stated that the NEPA guidelines must be satisfied as part of the corridor planning process.

The need for "designation of corridors to prevent *close-out* of suitable routes in the future" was supported by approximately 56% of the respondents, with 36% of the jurisdictions responding that corridor designation is not needed to prevent close-outs of future routes. The remaining 8% did not respond or comment.

NEED FOR REGIONAL APPROACH

The respondents overwhelmingly indicated "yes" to the need for a regional approach to corridor planning by federal agencies, with 76% indicating that they believed that corridor planning at a regional level would provide interjurisdictional continuity and management consistency. Furthermore, the Agencies agreed that interagency planning and designation consistency is necessary to avoid discontinuous corridors.

The most consistent statements made in response to the circumstances anticipated if regional corridor planning and corridor designation do not occur were: 1) a lack of coordination and duplication of effort; 2) significant increase in litigation, appeals, and conflicts; 3) significant increase in costs and time delays; 4) extensive environmental impacts; and 5) additional lost corridor opportunities.

CONSTRAINTS TO CORRIDORS

Responses regarding existing and future constraint categories were very similar and most jurisdictions noted the same eight to ten constraint categories. The five most important constraints affecting corridor location include: 1) wilderness and wilderness study areas; 2) visual resources or scenic areas; 3) rare, threatened, and endangered species habitat; 4) topography; and 5) cultural resources or historically sensitive areas. A list of the ten most consistent constraint categories considered exclusionary or potentially important to the future are identified under Question 11.

It should be noted that the natural resource (or special management area-type) constraint category was identified as being of particular significance. These areas include old-growth forests, sensitive species habitats, riparian areas, scenic areas, and poor soil condition areas. While these constraints may not be considered exclusionary in Agency Management Plans (nor do they represent congressionally designated areas), they are perceived as being increasingly highly valued as physical or biological resources. As such, they may constrain utility corridors presently and/or in the future.

USE OF THE 1986 STUDY

The questionnaire posed five questions (Questions 19-23) to document use of the 1986 *Study* and to identify information needed in this updated *Corridor Study*. In general, the 1986 *Western Regional Corridor Study* was reviewed or used as a reference tool by about two-thirds of the Agency jurisdictions. Overall, the 1986 *Study* was used as a reference document by those jurisdictions in the process of

preparing or updating their Land Use or Forest Plans. The Corridor Designation Status Map was useful for about 24% of the respondents and the State Corridor Maps were useful for about one-third of the respondents. Approximately 30% of the respondents had not reviewed the 1986 *Study*.

SUGGESTEO IMPROVEMENTS FOR THE STATE MAPS

The four consistently suggested improvements were the identification of corridor uses, jurisdictional boundaries, communication facilities, and pipeline facilities.

The questionnaire listed ten information categories (plus an opportunity to write-in others) that could be of use in future corridor planning efforts. Respondents were requested to indicate which categories they would find most useful for future corridor planning efforts. Of the categories listed, the most common response was "all", with most of the respondents checking all, or most of the boxes. No single category stood out as the most important, although "Energy Demand Projections and Technical/Engineering/Economic Feasibility of Compatible Use Corridors" were frequently mentioned in supplemental responses pertaining to future utility Industry responsibilities.

SUGGESTEO AGENCY ROLE AND RESPONSIBILITIES

Respondents indicated the primary responsibility of the Agencies is to participate in interagency coordination and work directly with the Western Utility Group. Other important responsibilities identified were : 1) consider corridors and routes in the Forest Plan and Land Use Planning Process; 2) identify exclusion areas and provide updated constraint data; 3) designate corridors in management plans; and 4) protect corridor needs providing for national security. In a few cases, the respondents quoted their own manuals or the Code of Federal Regulations.

SUGGESTED INDUSTRY ROLE AND RESPONSIBILITIES

Suggested Industry responsibilities identified by the Agencies included: 1) the identification of corridor needs; 2) active and effective participation in the federal land planning process; 3) understanding the complexity of the Agency's need to balance resource values and Industry needs; and 4) provide technical information on corridor compatibility, economic feasibility, and engineering requirements.

Many jurisdictions indicated their desire to continue to foster direct one-on-one contact with Industry representatives in addressing corridor planning issues. In addition, numerous jurisdictions identified the need

for the Western Utility Group to take the lead role in coordinating the on-going collection of updated information to serve both the Agencies and the Industry. Active participation and involvement in the planning process was repeatedly stressed as an effective way to best work with the Agencies in developing a regional plan for corridor designation. Many jurisdictions indicated their desire to continue this effort through establishment of a "task force" or issue management system to keep both the Industry and the Agencies up-to-date on the issues facing the them and the short and long-term corridor needs of the Industry.

RECORD OF RESPONSES

1. The following definition of a corridor is used by the Western Utility Group in their corridor planning efforts:

> *A corridor is a linear strip of land without definite width, but limited by technological, environmental and topographical factors, and containing one or more utility, communication, or transportation facilities. A corridor is a land use designation, identified for the purpose of establishing policy direction as to the preferred location of compatible linear facilities and compatible and conflicting land uses. It does not imply entitlement of use. Appropriate environmental review and regulatory permitting must precede occupancy on a project-specific basis.*

Is this definition consistent with your Management Plan definition of a "corridor"?

54% – Consistent
36% – Not Consistent
10% – Did Not Define

2. What is the primary purpose of a corridor?

1. To define and consolidate ROW's
2. Minimize environmental impacts
3. Restrict utilities to defined location
4. To contain transportation/transmission routes (as preferred routes)

3. Does your jurisdiction designate corridors?

16% – Yes, Existing
4% – Yes, Planned
51% – Yes, Both
27% – No
2% – No Response

4. Does your Management Plan designate corridors?
   27% – Yes, Existing Only
   2% – Yes, Planned Only
   32% – Yes, Both
   37% – No
   2% – No Response

5. Does your jurisdiction or Management Plan "identify" existing corridors rather than formally designate corridors?
   25% – Yes, Existing Only
   2% – Yes, Planned Only
   34% – Yes, Both
   39% – No

6. Is there a need for a regional approach to corridor planning by federal agencies?
   85% – Yes
   15% – No

7. Do you believe that corridor planning at a regional level will provide interjurisdictional continuity and management consistency?
   76% – Yes
   15% – No
   6% – Maybe
   3% – No Answer

8. Do you agree that interagency corridor planning and designation consistency are necessary to avoid discontinuous corridors, which could defeat the purpose of corridor designation?
   95% – Yes
   1% – No
   4% – No Answer

9. Would you agree that protected resource areas along with lands dedicated to an exclusive use, such as military bases, combine to constrain routing options?
   90% – Yes
   5% – No
   5% – No Answer

10. Do you believe that designation of corridors is needed to prevent "close-out" of suitable routes in the future?

56% – Yes
36% – No
8% – No Answer

11. What are the five (5) most important constraints affecting corridor location within your jurisdiction? *Constraints listed in order of importance.*

1. Wilderness Areas & Wilderness Study Areas
2. Visual-Scenic Areas
3. Rare, Threatened and Endangered Species Habitat
4. Topography
5. Cultural Resource Sensitive Areas
6. Land Use-Private Ownership/ Rural Urban Interface
7. Other Wildlife Resources
8. Wild & Scenic Rivers
9. Existing Corridors
10. ACEC's

12. What areas are considered exclusionary (prohibiting corridor location) within your jurisdiction?

1. Wilderness, WSA's
2. ACEC's
3. RNA's
4. RT&E Habitat
5. Visual/Scenic Resource Areas
6. Recreation Areas-NRA's
7. Other Wildlife Resources
8. Withdrawals-Military

13. Which corridor constraints/exclusion areas will become increasingly important in the next 20 years?

1. Wilderness
2. RT&E Habitat
3. Visual-Scenic Areas
4. Wild & Scenic Rivers
5. ACEC's
6. Other Wildlife Resources (Old Growth Forest)
7. Recreation Areas
8. Cultural Resources
9. RNA's-Soils, Riparian Areas

14. Will the designation of corridors in federal land use plans expedite review and permitting procedures for new facilities located within existing corridors?

78% – Yes
17% – No
1% – Partially
4% – No Answer

15. Would you agree that designated corridors, adopted as part of federal land management plans, eliminate (or lessen) the need to consider routing alternative?

62% – Agree
38% – Disagree

Most "agree responses" were tied to the statement that designated corridors lessen, but do not eliminate the need to consider alternatives. NEPA must be satisfied as part of the process.

16. Would the establishment of designated corridors encourage consolidation of separate rights of way and reduce potential adverse environmental effects?

85% – Yes
15% – No

17. Would you agree that, through corridor planning, the agency costs associated with project siting, environmental review and permitting are significantly reduced?

60% – Yes
40% – No

18. What circumstances would you anticipate in the future if regional corridor planning and corridor designation do not occur? *Twenty percent (20%) did not answer*

1. Lack of coordination/duplication of effort
2. Significant increase in conflicts = appeals and litigation
3. Significant increase in costs and time delays
4. Extensive environmental impacts
5. More corridor close-outs, lost opportunities

19. Have you had the opportunity to review the 1986 *Western Regional Corridor Study*?

68% – Yes
32% – No

20. How has the 1986 *Study* been used by your jurisdiction?

1. Guidance during Forest Plan/Land Use Plan process, reference document
2. Reviewed only
3. Not used
4. No answer – non-related comment

21. What was the most useful aspect of the 1986 *Study*?

24% – Corridor Designation Status Map
7% – Suggested Planning Action
30% – State Corridor Maps
30% – No answer
9% – Not useful

22. How could the State Corridor Maps be improved?

No improvement necessary: Scale, Color, Labeling
Improvement necessary: Corridor Uses, Jurisdictional Boundaries, Communication Facilities, Pipelines

23. What additional information would be of use in your future corridor planning efforts?

Update of the 1986 State Corridor Maps
Update of the 1986 Corridor Designation Status Map
Preparation of a Western States Corridor Map
Identification of Corridor Uses
Identification of Corridor Exclusion/Constraint Areas
Location of Generation Facilities
Energy Demand Projections
Identification of Areas with Limited Access or that are Very Constrained
Technical/Engineering/Economic Feasibility of Compatible Use Corridors
Identification of Potential Compatible Use Corridors

Most respondents checked all, or most of the information.

24. What should the responsibilities of the federal government be in regional corridor planning?

1. Inter-agency participation/coordination
2. Coordination with Western Utility Group
3. Consider routes in Forest Plan/Land Use Plan
4. Identify exclusion areas – provide constraint data
5. Designate corridors in Management Plan
6. Protect corridor needs/provide for national security

25. What should the responsibilities of your agency/jurisdiction be in regional corridor planning?

1. Inter-agency participation/coordination
2. Coordination with Western Utility Group
3. Consider routes in Forest Plan/Land Use Plan
4. Identify exclusion areas-provide constraint data
5. Designate corridors in Management Plan
6. Protect corridor needs/provide for national security

26. What should the responsibilities of the utility industry be in regional corridor planning?

1. Identify corridor needs
2. Actively participate in the federal land planning process
3. Understand the complexity of agency issues, balancing resource values and needs
4. Provide technical information regarding engineering considerations

27. How can the utility industry best work with the federal land management agencies to develop a regional plan for corridor designation?

1. Update the *Western Regional Corridor Study*
2. Actively participate in the federal land planning process
3. Become involved in the process early and stay involved
4. Take the lead responsibility for corridor designation issues

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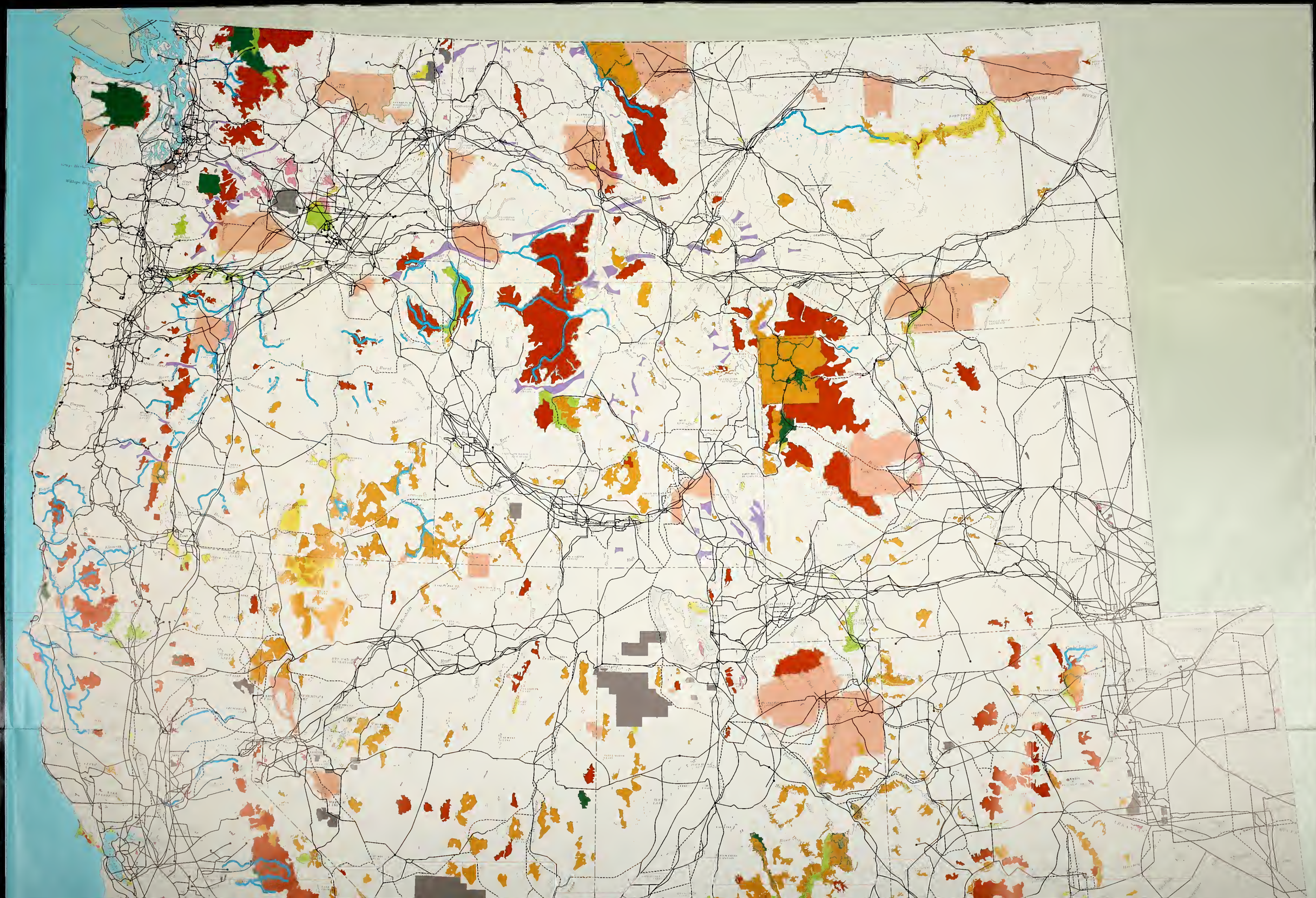

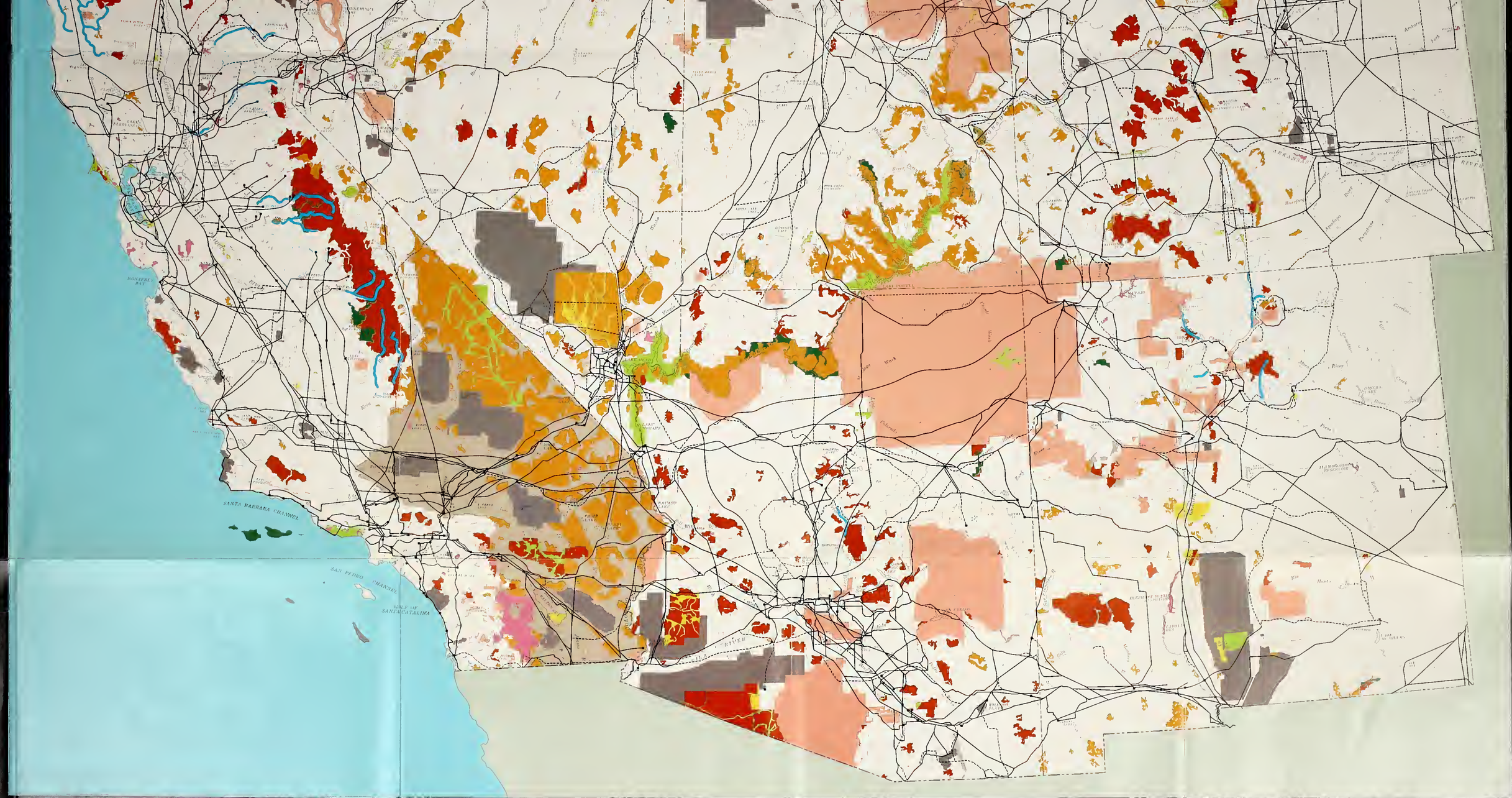

LEGEND

- Wilderness Area
- Wilderness Study Area
- Indian Land
- National Park
- National Conservation Area
- National Wildlife Refuge
- Wild & Scenic River
- Military Use Area
- Other Federal Land*
- State Designated Land
- Existing Corridor
- Proposed Corridor
- Energy Source
- Corridor Window

SCALE 1:2,500,000

0 10 20 50 100 150 Miles

*Includes National Monuments, National Recreation Areas & National Scenic Areas

WESTERN STATES

WESTERN REGIONAL CORRIDOR STUDY

WESTERN STATES

PREPARED FOR WESTERN UTILITY GROUP
BY MICHAEL CLAYTON & ASSOCIATES

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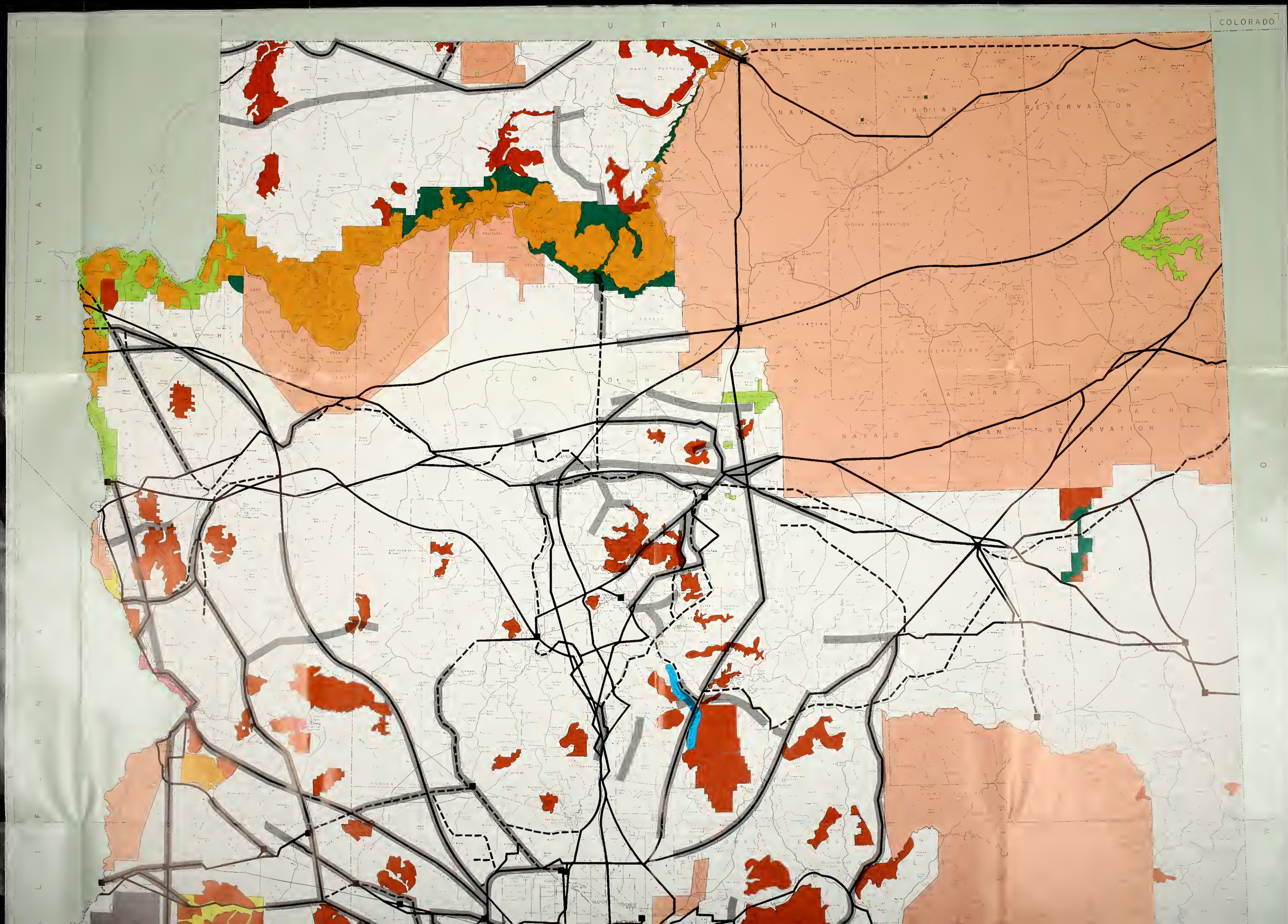
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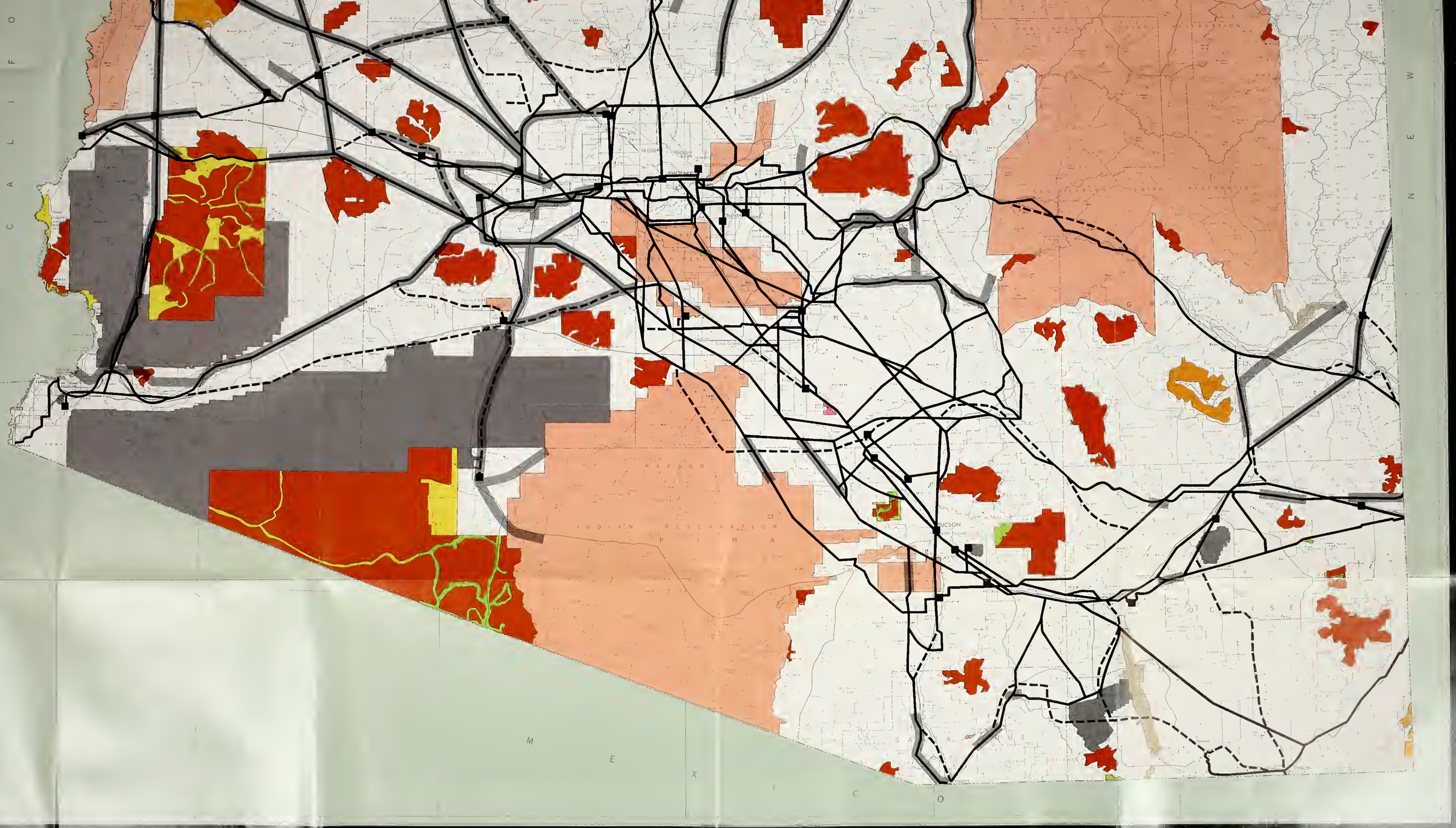

LEGEND

- Wilderness Area
- Wilderness Study Area
- Indian Land
- National Park
- National Conservation Area
- National Wildlife Refuge
- Wild & Scenic River
- Military Use Area
- Other Federal Land*
- State Designated Land

SCALE 1: 500,000

0 5 10 20 30 40 Miles

- Existing Corridor
- Proposed Corridor
- Agency Designated Corridor
- Corridor Window
- Energy Source

*Includes National Monuments, National Recreation Areas & National Scenic Areas

ARIZONA

WESTERN REGIONAL CORRIDOR STUDY

ARIZONA

PREPARED FOR WESTERN UTILITY GROUP
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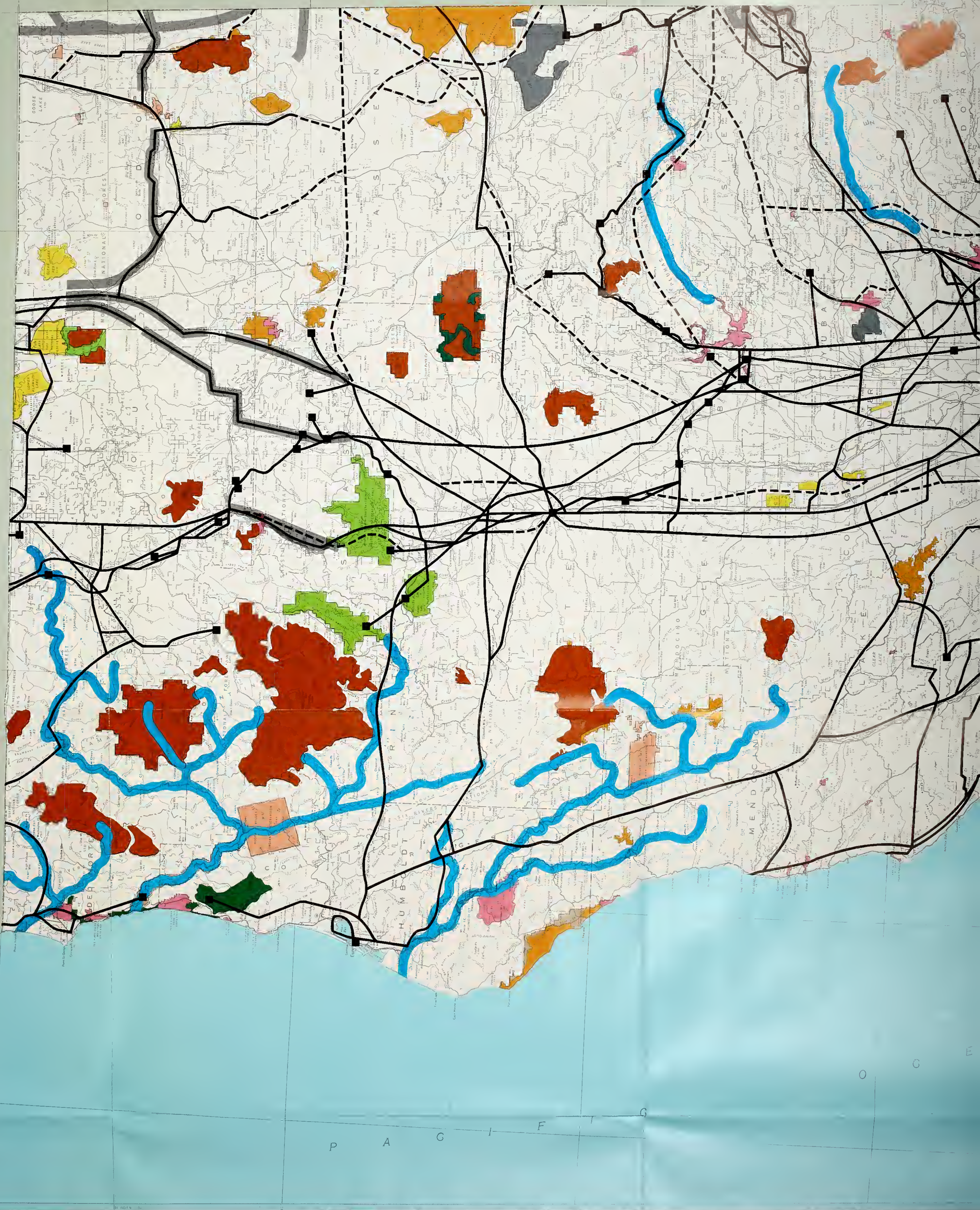
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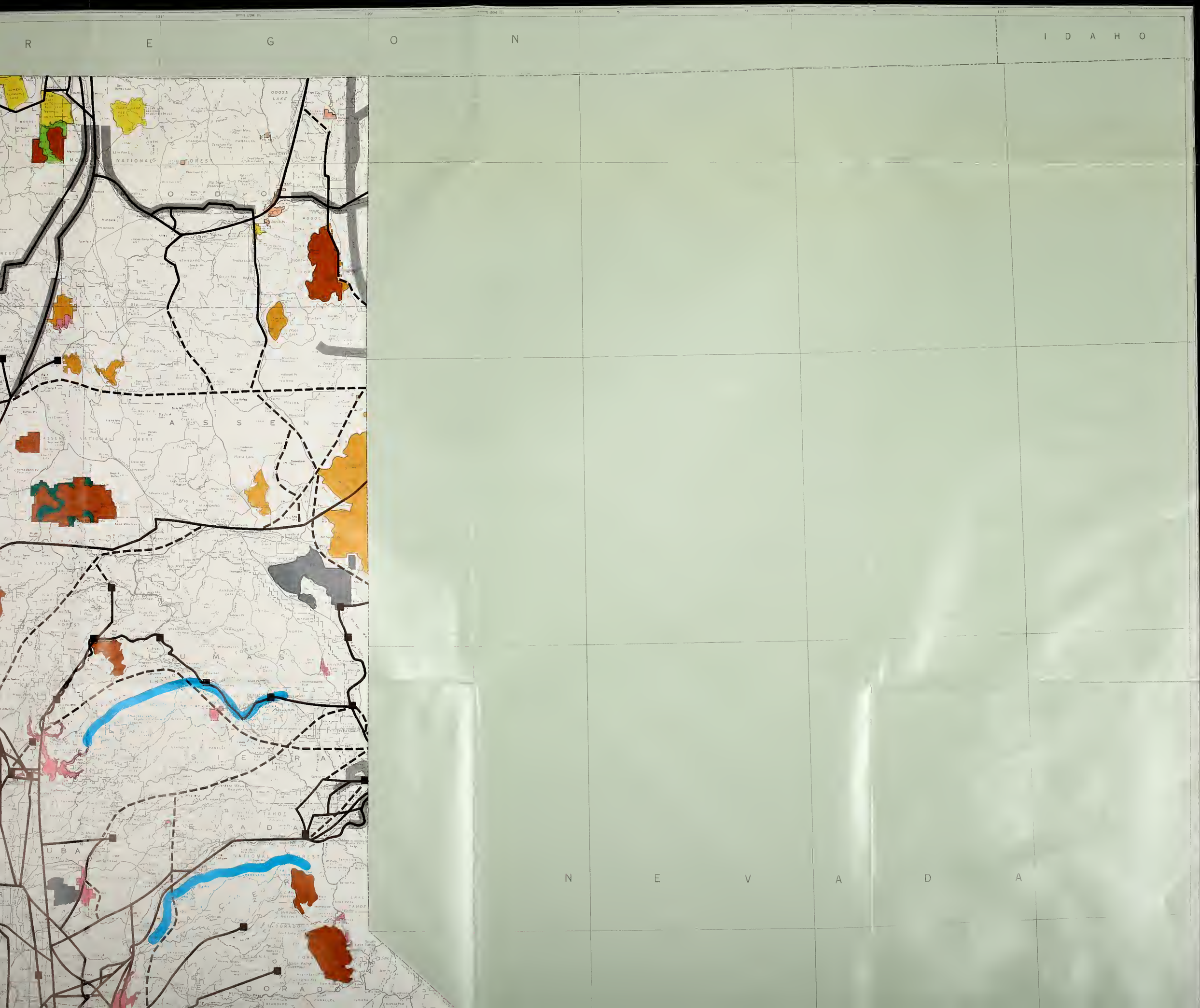
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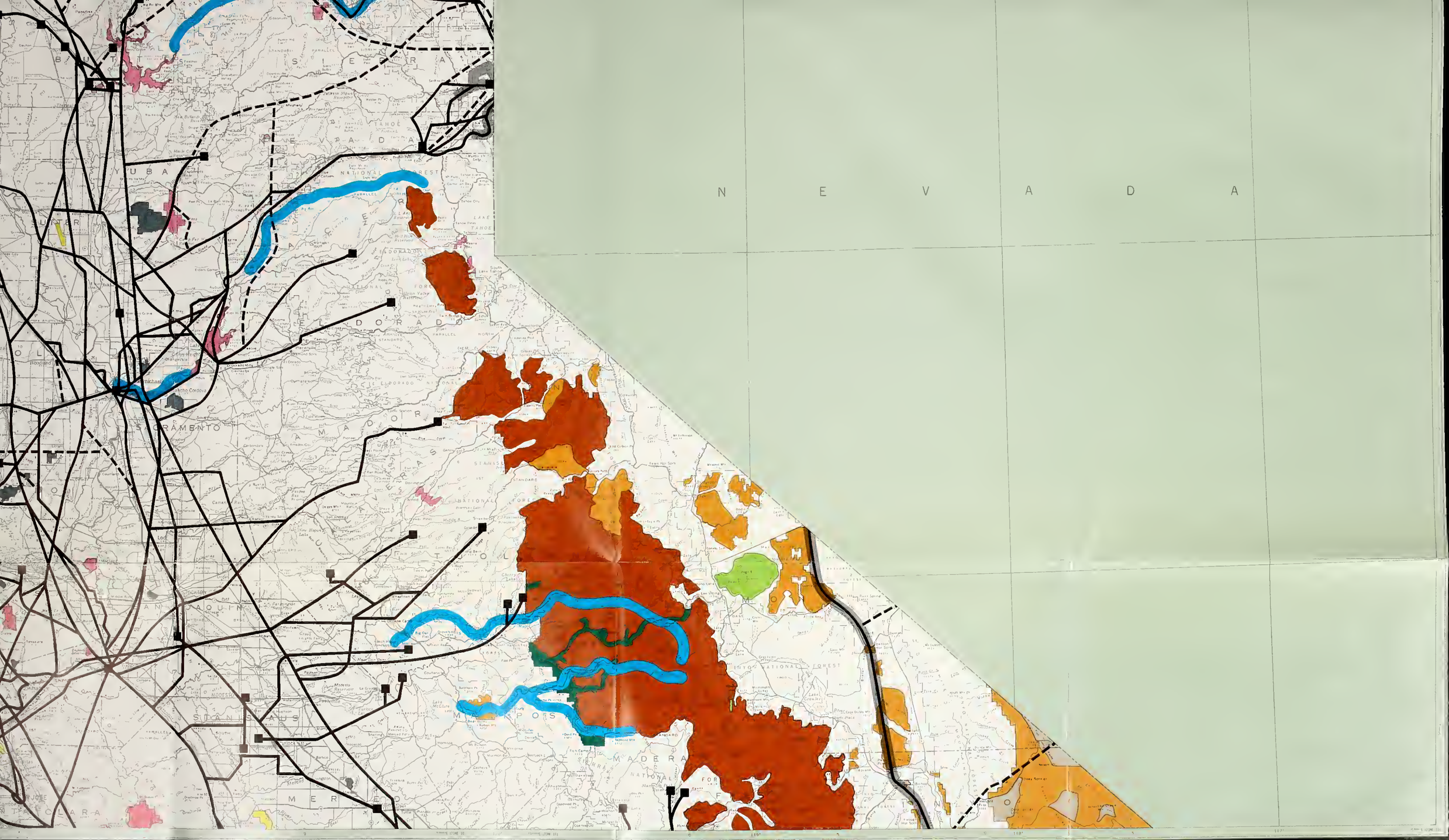

NORTHERN CALIFORNIA

WESTERN REGIONAL CORRIDOR STUDY

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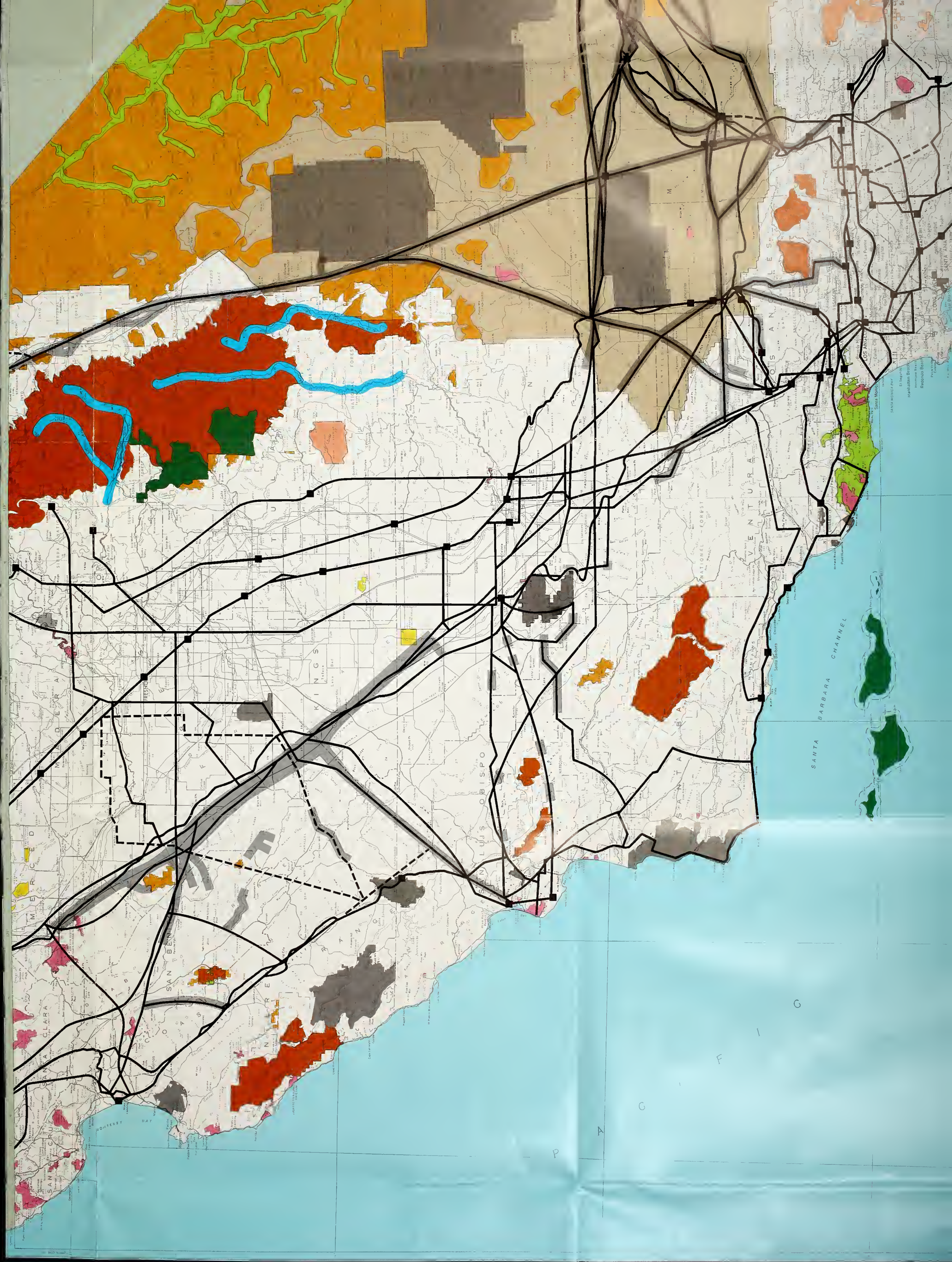
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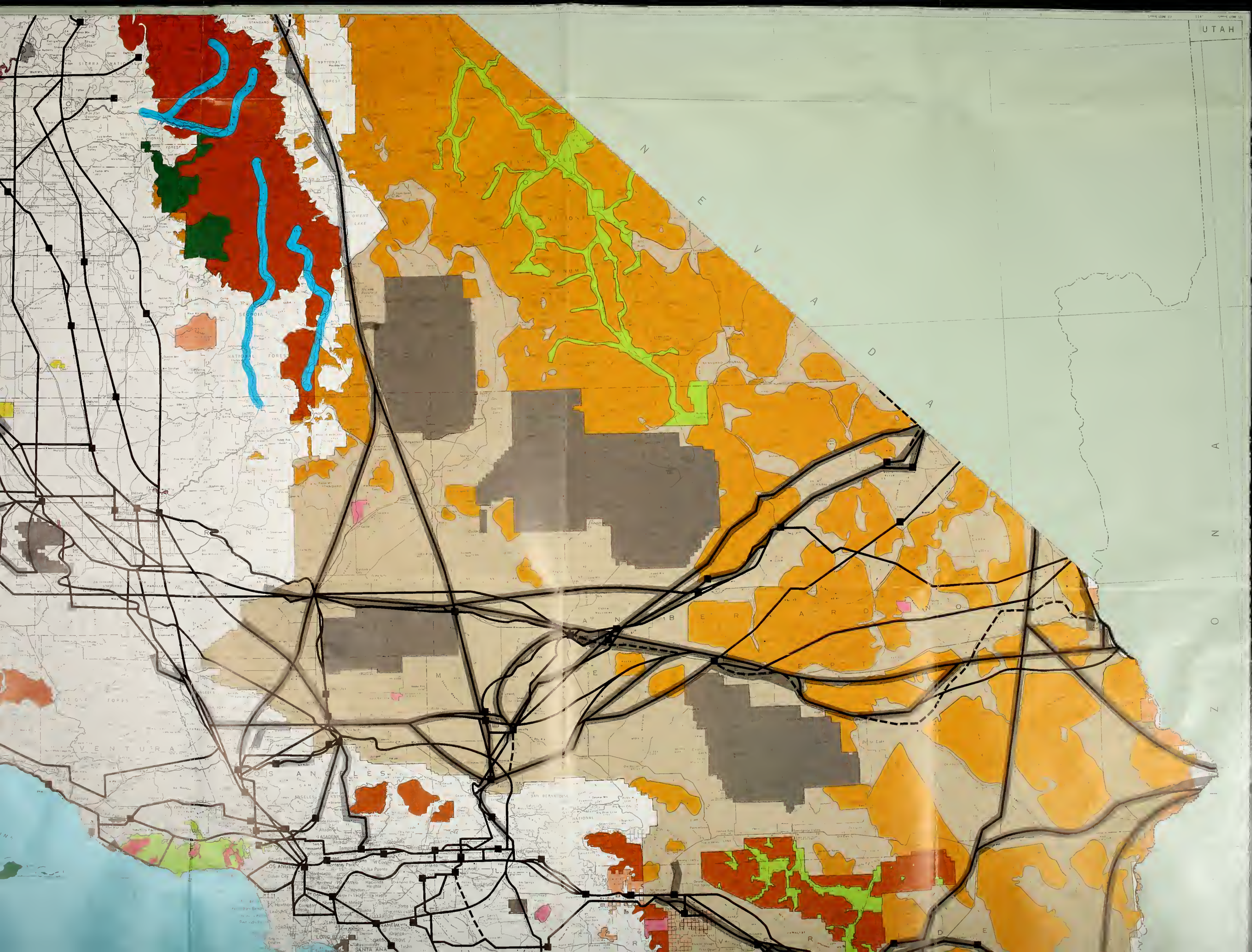
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Ivanpah
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Nipton
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Mojave
Tehachapi
Bakersfield
Taft
Maricopa
Lancaster
Palmdale
Pacific Ocean

LEGEND

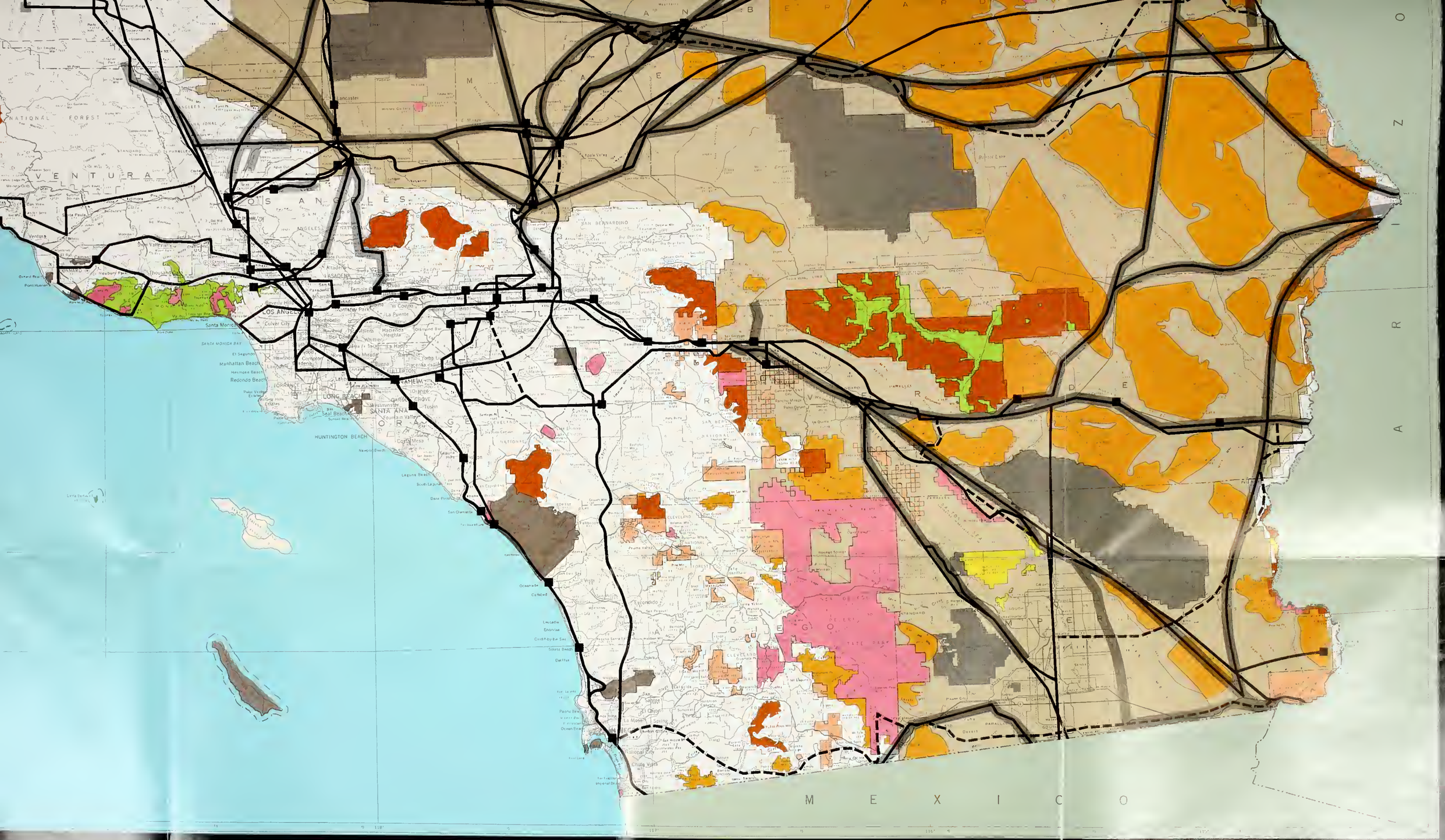
- Wilderness Area
- Wilderness Study Area
- Indian Land
- National Park
- National Conservation Area
- National Wildlife Refuge
- Wild & Scenic River
- Military Use Area
- Other Federal Land*
- State Designated Land
- Existing Corridor
- Proposed Corridor
- Agency Designated Corridor
- Corridor Window
- Energy Source

SCALE 1:750,000

0 5 10 20 30 40 Miles

*Includes National Monuments, National Recreation Areas & National Scenic Areas

SOUTHERN CALIFORNIA



SOUTHERN CALIFORNIA

WESTERN REGIONAL CORRIDOR STUDY

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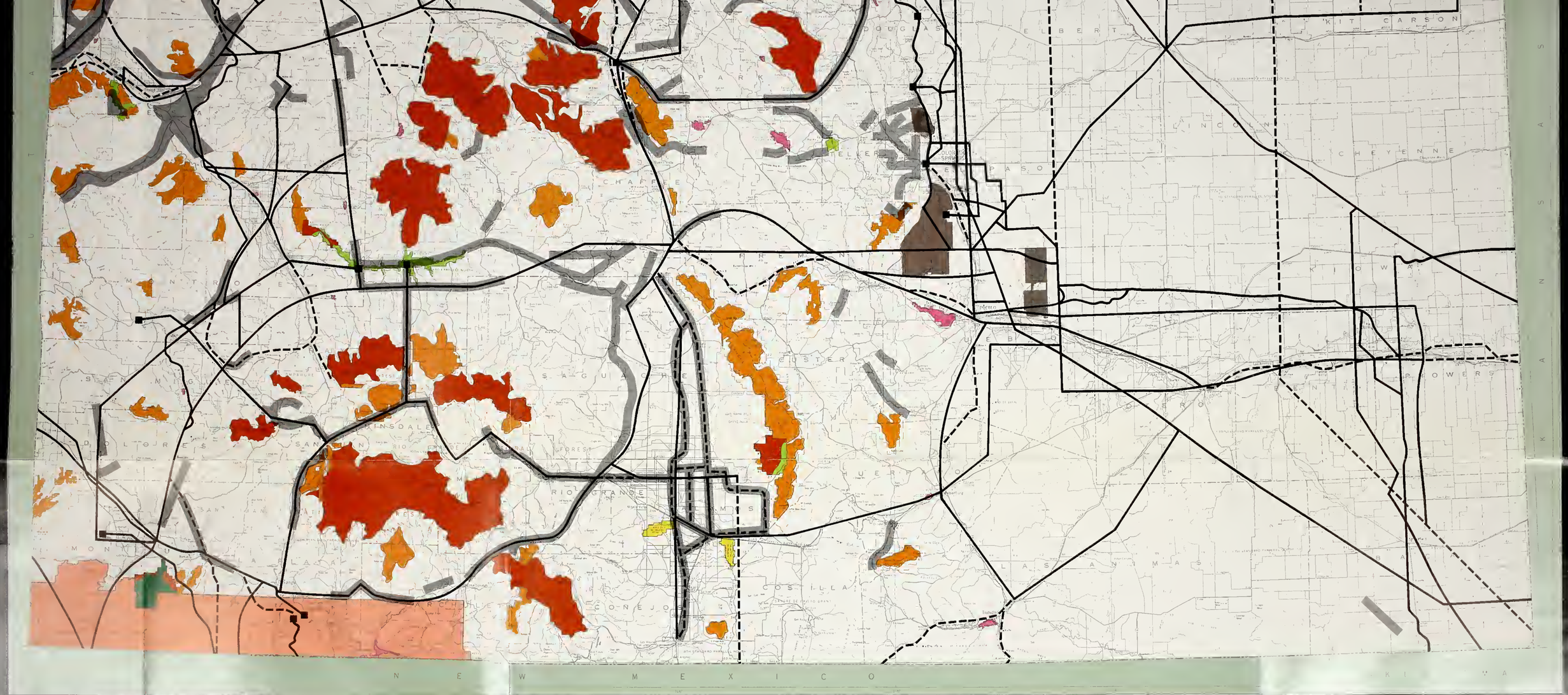

LEGEND

- Wilderness Area
- Wilderness Study Area
- Indian Land
- National Park
- National Conservation Area
- National Wildlife Refuge
- Wild & Scenic River
- Military Use Area
- Other Federal Lands
- State Designated Land
- Existing Corridor
- Proposed Corridor
- Agency Designated Corridor
- Corridor Window
- Energy Source

SCALE 1:750,000

0 5 10 20 30 40 Miles

Includes National Monuments, National Recreation Areas & National Scenic Areas

COLORADO

WESTERN REGIONAL CORRIDOR STUDY

COLORADO

PREPARED FOR WESTERN UTILITY GROUP
BY MICHAEL CLAYTON & ASSOCIATES

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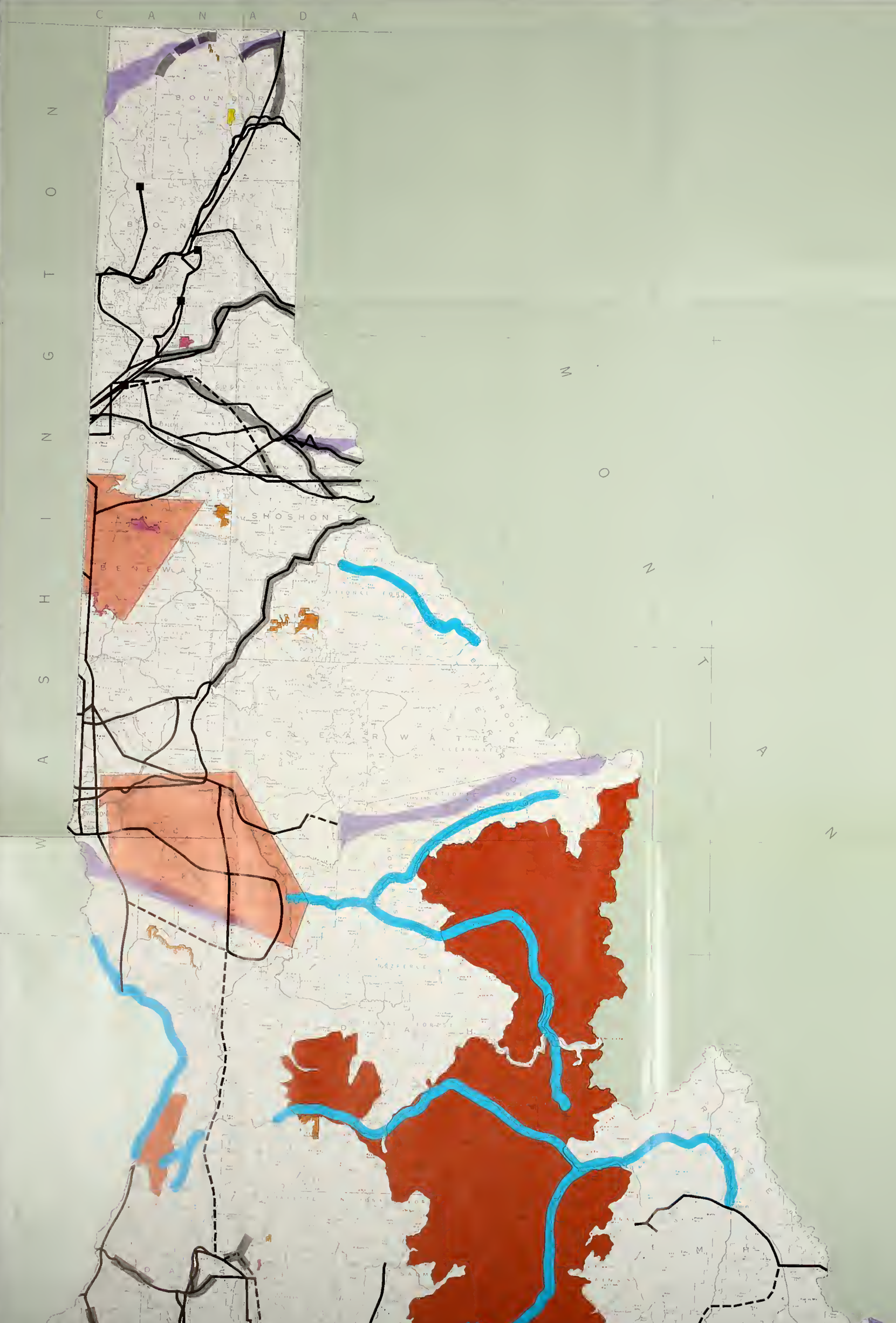
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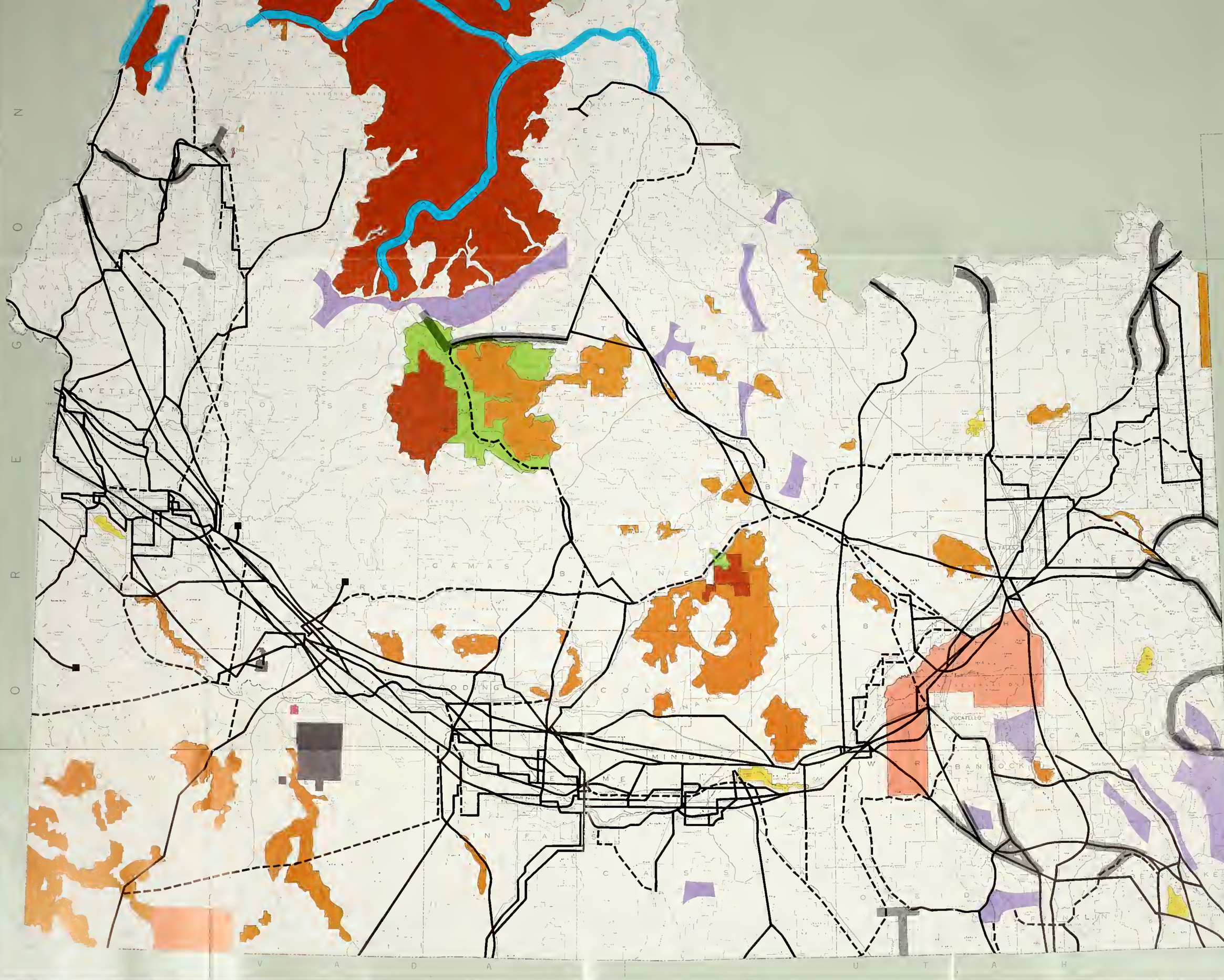
BONNER
SHOSHONE
BENEWAH
CLEARWATER
MOCCASIN
MONTANA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UTAH
MONTANA
LEWISTON
POCATELLO
IDAHO FALLS
BONNEVILLE
JEFFERSON
CLARK
FREMONT
BANNOCK
CARIBOU
BUTTE
CUSTER
LEMHI
CANYON
ADA
ELMORE
GOODING
MINIDOKA
CASSIA
OWYHEE
BOISE
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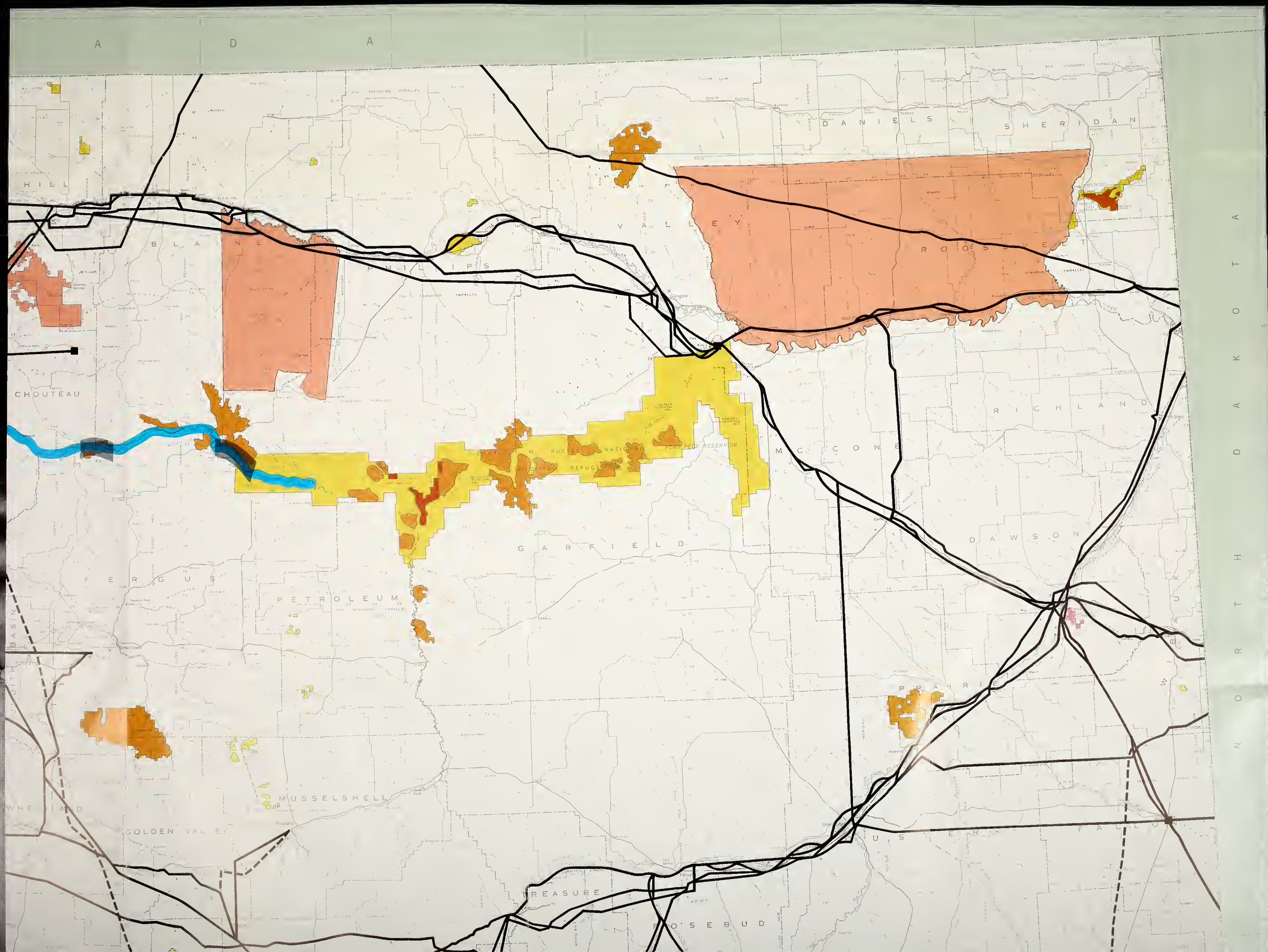
WEISER
GRANGE
SALMON
BOISE
SNAKE
RIVER
SOUTH FORK
SOUTH FORK
SOUTH FORK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DANIELS
SHERIDAN
HILL
BLAINE
PHILLIPS
VALLEY
ROOSEVELT
CHOUTEAU
RICHLAND
MCCONE
DAWSON
GARFIELD
FERGUS
PETROLEUM
PRAIRIE
MUSSELSHELL
GOLDEN VALLEY
WHEATLAND
TREASURE
ROSEBUD
Glasgow
Wolf Point
Havre
Malta
Scobey
Plentywood
Opheim
Baker
Jordan
Winifred
Roundup
Lewistown
Harlowton
Shawmut
Shambo Springs
Fort Peck Reservoir
Missouri River
Milk River
Musselshell River
Yellowstone River
Big Dry Creek
Big Sandy Creek
Frenchman Creek
Cottonwood Creek
Dry Creek
Fort Peck Dam
Fort Peck Indian Reservation
Fort Peck Indian Reservation Boundary
Fort Peck Indian Reservation Boundary (Extended)
Fort Peck Indian Reservation Boundary (Extended)
Fort Peck Indian Reservation Boundary (Extended)

LEGEND

- Wilderness Area
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- National Conservation Area
- National Wildlife Refuge
- Wild & Scenic River
- Military Use Area
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- Proposed Corridor
- Agency Designated Corridor
- Corridor Window
- Energy Source

SCALE 1:750,000

0 5 10 20 30 40 Miles

*Includes National Monuments, National Recreation Areas & National Scenic Areas

EASTERN MONTANA

WESTERN REGIONAL CORRIDOR STUDY

EASTERN MONTANA

PREPARED FOR WESTERN UTILITY GROUP
BY MICHAEL CLAYTON & ASSOCIATES

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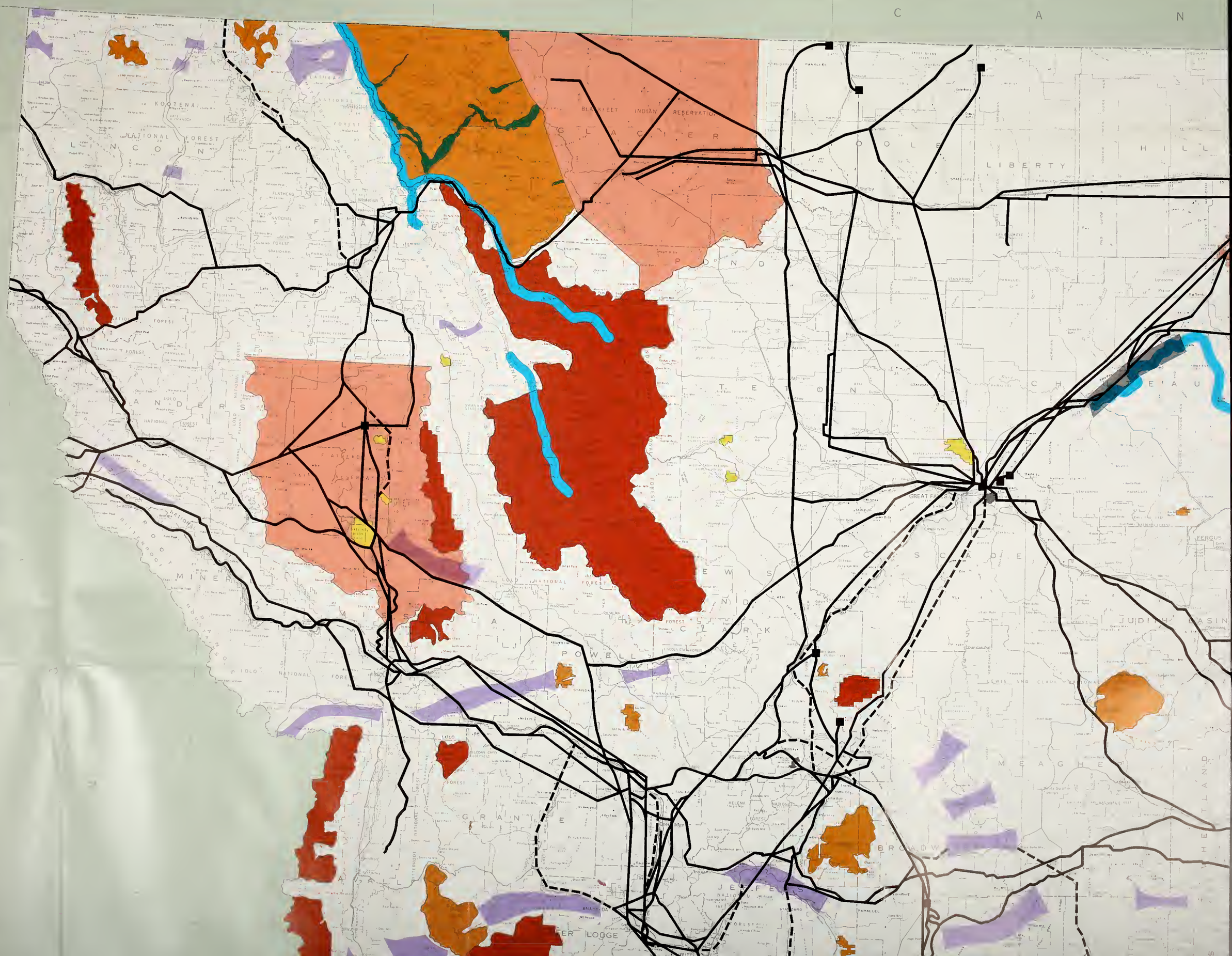
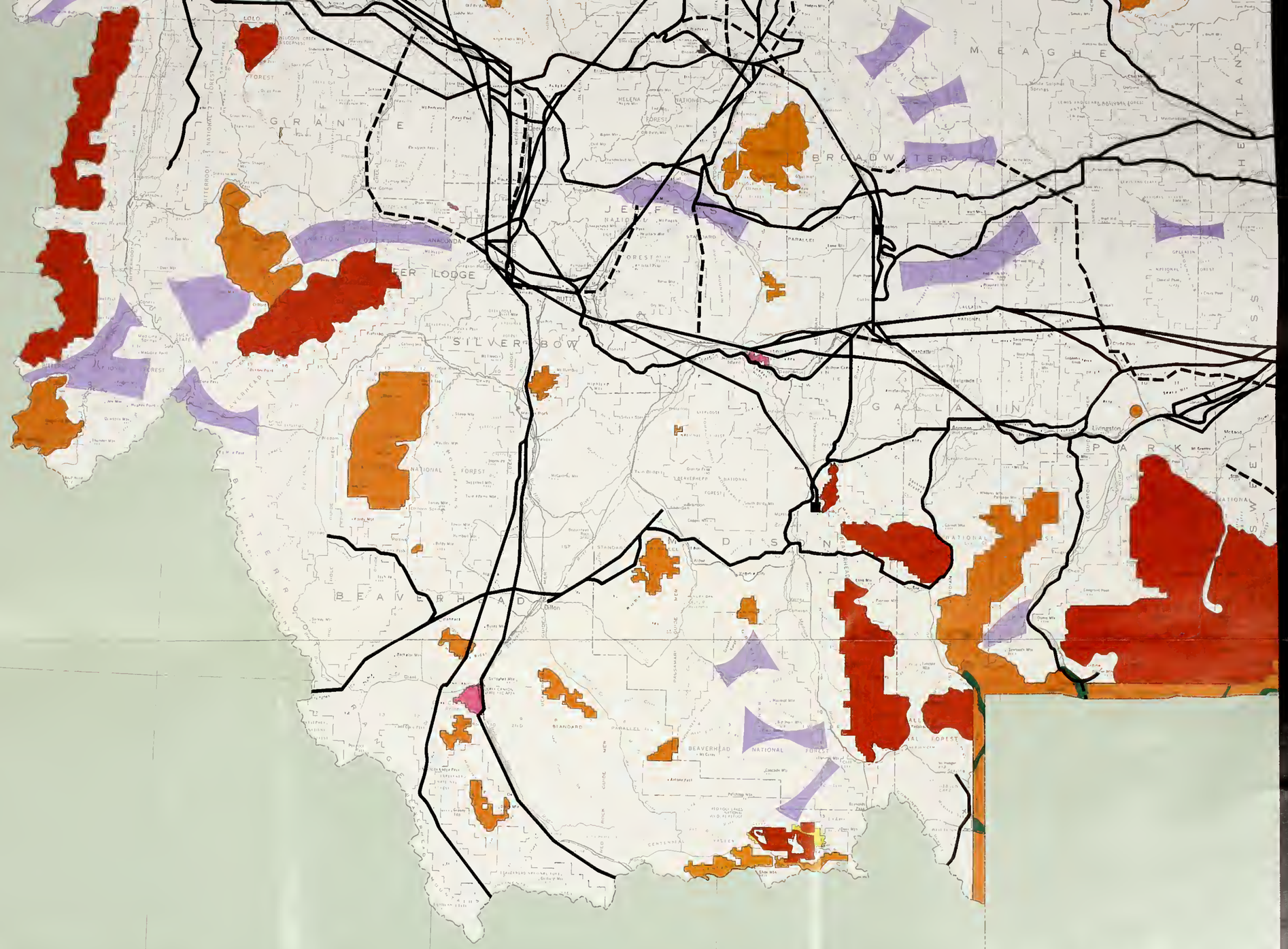

C A N
KOOTENAI
NATIONAL FOREST
LINCOLN
BLACKFEET INDIAN RESERVATION
GLACIER
LIBERTY
HILL
CHOUTEAU
FLATHEAD
LAKE
SANDERS
MINERAL
MISSOULA
POWELL
GRANT
JEFFERSON
BROADWATER
MEAGHER
CASCADE
JUDITH BASIN
LEWIS AND CLARK
GREAT FALLS
HELENA
BUTTE
ANACONDA
DEER LODGE
Whitefish
Kalispell
Lincoln
Shelby
Conrad
Choteau
Fergus
Lonesome Prairie



LEGEND

- Wilderness Area
- Wilderness Study Area
- Indian Land
- National Park
- National Conservation Area
- National Wildlife Refuge
- Wild & Scenic River
- Military Use Area
- Other Federal Land*
- State Designated Land
- Existing Corridor
- Proposed Corridor
- Agency Designated Corridor
- Corridor Window
- Energy Source

SCALE 1:750,000

0 10 20 30 40 Miles

*Includes National Monuments, National Recreation Areas & National Scenic Areas

WESTERN MONTANA

WESTERN REGIONAL CORRIDOR STUDY

WESTERN MONTANA

PREPARED FOR WESTERN UTILITY GROUP
BY MICHAEL CLAYTON & ASSOCIATES

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O R E G O N
I D A H O
C A L I F O R N I A
U T A H
H U M B O L D T
P E R S H I N G
L A N D E R
E U R E K A
C H U R C H I L L
W H I T E P I N E
E L K O
D O U G L A S

LEGEND

- Wilderness Area
- Wilderness Study Area
- Indian Land
- National Park
- National Conservation Area
- National Wildlife Refuge
- Wild & Scenic River
- Military Use Area
- Other Federal Land*
- State Designated Land

SCALE 1:750,000

0 5 10 20 30 40 Miles

- Existing Corridor
- Proposed Corridor
- Agency Designated Corridor
- Corridor Window
- Energy Source

*Includes National Monuments, National Recreation Areas & National Scenic Areas

NEVADA

WESTERN REGIONAL CORRIDOR STUDY

NEVADA

PREPARED FOR WESTERN UTILITY GROUP
BY MICHAEL CLAYTON & ASSOCIATES

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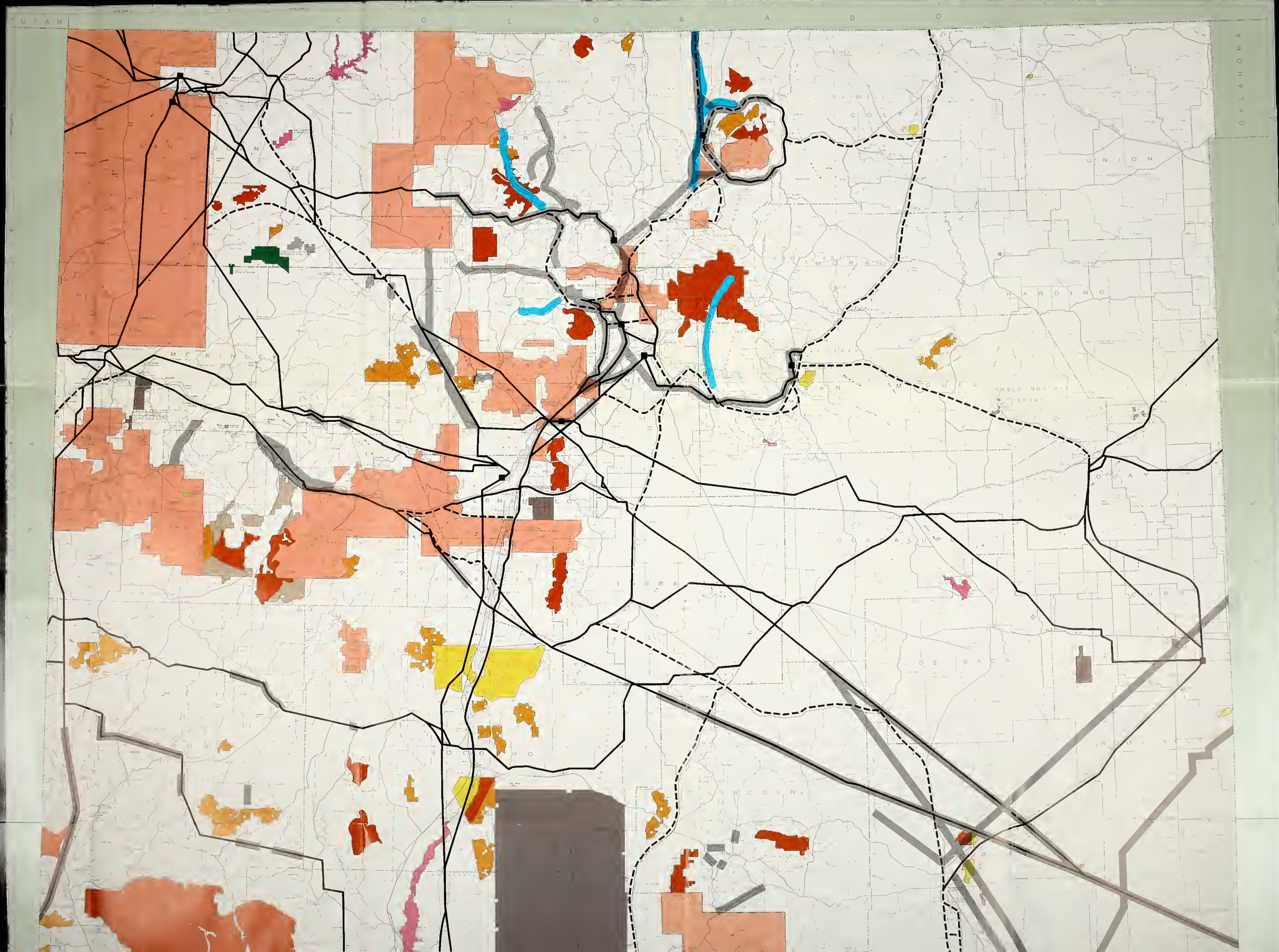
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COLORADO
OKLAHOMA
SAN JUAN
RIO ARRIBA
COLFAX
UNION
MORA
HARDING
MCKINLEY
SANDOVAL
SAN MIGUEL
PABLO MONTOYA GRANT
QUAY
BERNALILLO
VALENCIA
TORRANCE
GUADALUPE
CURRY
DE BACA
ROOSEVELT
SOCORRO
LINCOLN
CHACO CULTURE NATIONAL HISTORICAL PARK
ALBUQUERQUE
GALLUP
GRANTS
LOS LUNAS
ROSWELL

LEGEND

- Wilderness Area
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- Indian Land
- National Park
- National Conservation Area
- National Wildlife Refuge
- Wild & Scenic River
- Military Use Area
- Other Federal Land*
- State Designated Land
- Existing Corridor
- Proposed Corridor
- Agency Designated Corridor
- Corridor Window
- Energy Source

SCALE 1:750,000

0 5 10 20 30 40 Miles

*Includes National Monuments, National Recreation Areas & National Scenic Areas

New Mexico

Western Regional Corridor Study

New Mexico

PREPARED FOR WESTERN UTILITY GROUP
BY MICHAEL CLAYTON & ASSOCIATES

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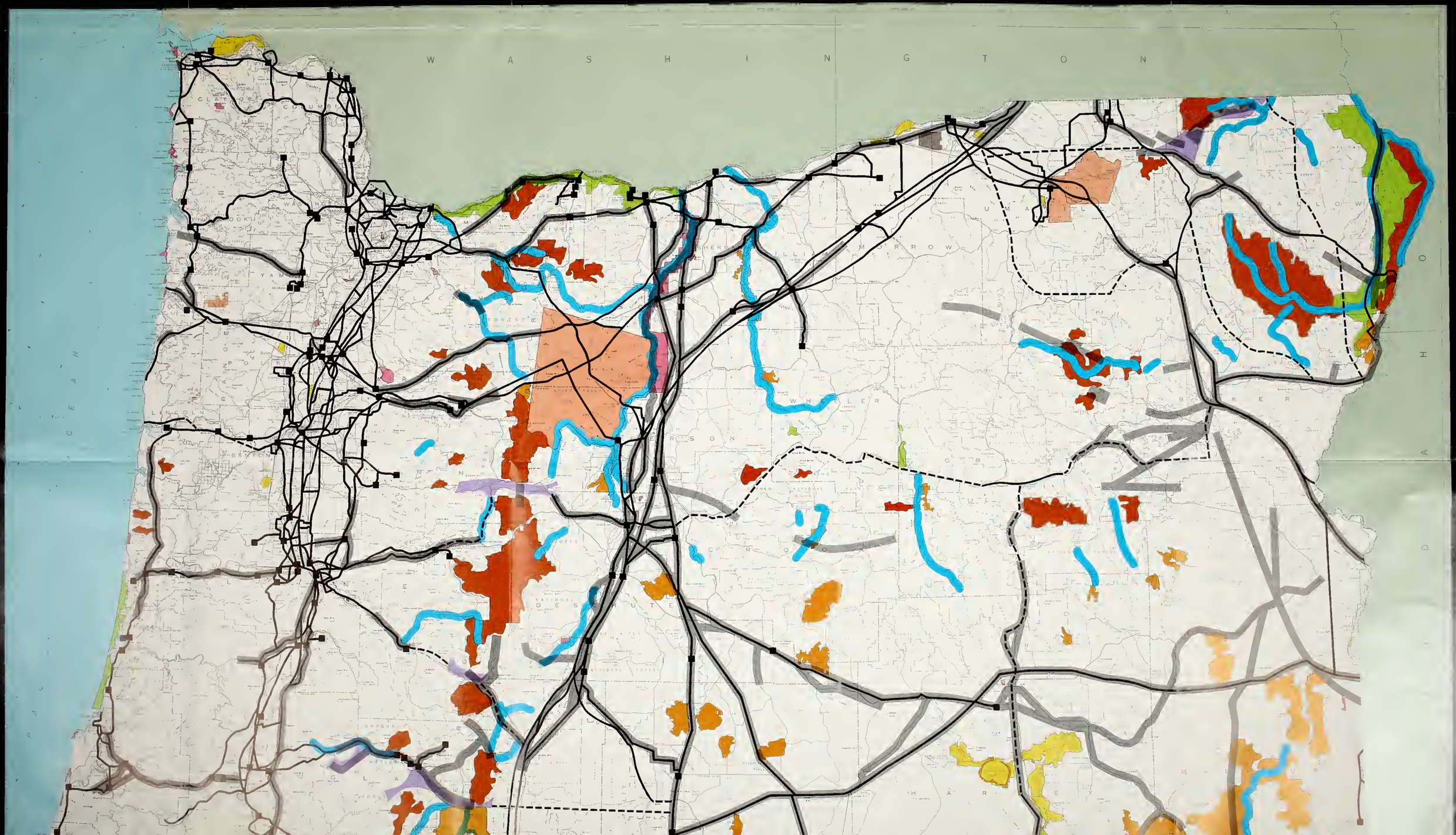
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O R E G O N
I D A H O
C L A T S O P
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C L A C K A M A S
M U L T N O M A H
H O O D R I V E R
W A S C O
S H E R M A N
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C R O O K
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J O S E P H I N E
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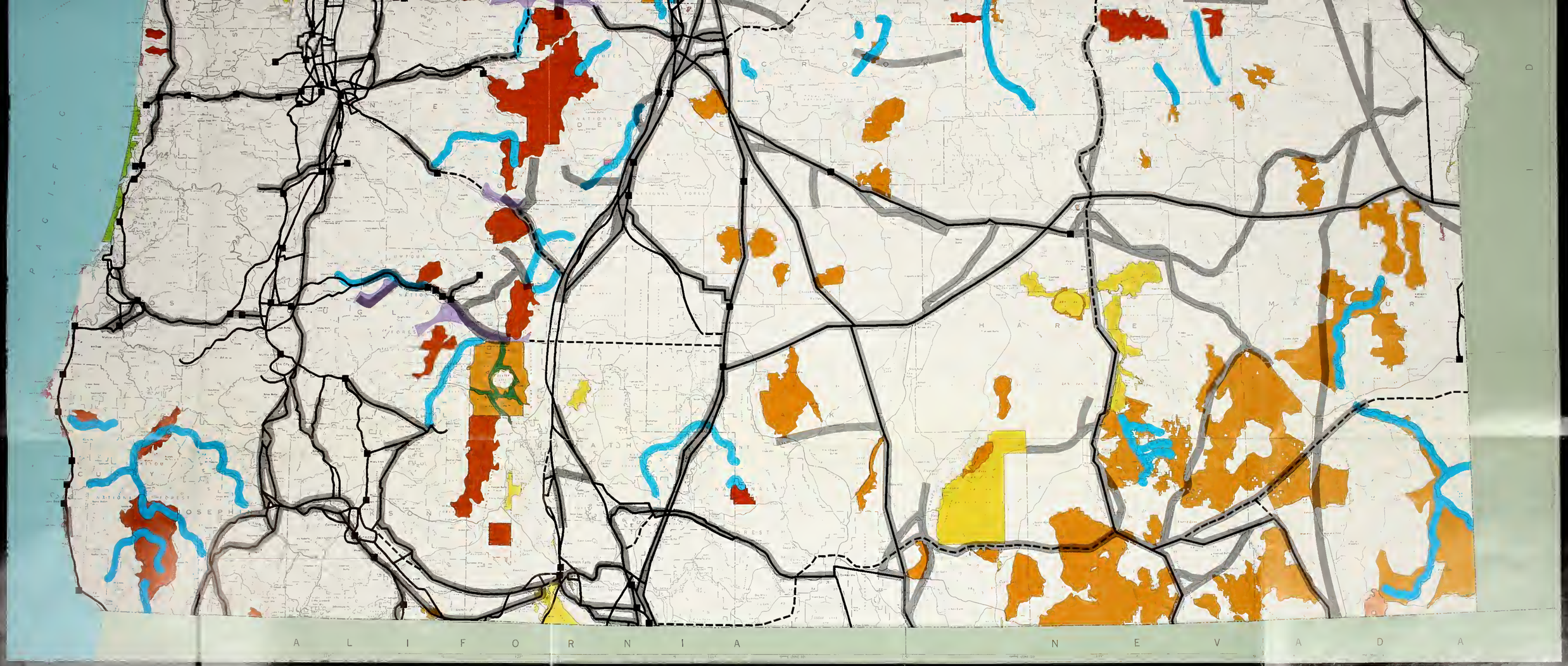
T I L L A M O O K



LEGEND

- Wilderness Area
- Wilderness Study Area
- Indian Land
- National Park
- National Conservation Area
- National Wildlife Refuge
- Wild & Scenic River
- Military Use Area
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- State Designated Land
- Existing Corridor
- Proposed Corridor
- Agency Designated Corridor
- Corridor Window
- Energy Source

SCALE 1:750,000

0 5 10 15 30 40 Miles

*Includes National Monuments, National Recreation Areas & National Scenic Areas

OREGON

WESTERN REGIONAL CORRIDOR STUDY

OREGON

PREPARED FOR WESTERN UTILITY GROUP
BY MICHAEL CLAYTON & ASSOCIATES

I D A H O
W Y O M I N G
C O L O R A D O
A R I Z O N A
U T A H
D A V I S
W E B E R
M O R G A N
C A C H E
R I C H
S A N P E T E
E M E R Y
C A R B O N
D U C H E S N E
U I N T A
W A S A T C H
U T A H
G R A N D
S A N J U A N
Logan
Ogden
Salt Lake City
Provo
Price
Vernal
Moab
Blanding
Monticello
Kanab
Richfield
Manti
Nephi
Tooele
Wendover
Delta
Fillmore
Milford
Cedar City
Parowan
Beaver
Panguitch
Escalante
Tropic
Bicknell
Loa
Hanksville
Green River
Castle Dale
Huntington
Ferron
Emery
Orangeville
Wellington
Helper
Duchesne
Roosevelt
Manila
Vernon
Grantsville
Stockton
Ophir
Dugway
Knolls
Gunnison
Sanpete
Sevier
Piute
Wayne
Garfield
Kane
Washington
Iron
Beaver
Millard
Juab
Tooele
Rich
Cache
Box Elder
Weber
Morgan
Davis
Summit
Wasatch
Uintah
Duchesne
Carbon
Emery
Grand
San Juan
Wasatch National Forest
Uinta National Forest
Manti-La Sal National Forest
Fishlake National Forest
Dixie National Forest
Ashley National Forest
Great Salt Lake
Great Salt Lake Desert
Sevier Desert
Uinta Mountains
Wasatch Mountains
Sanpete Valley
Green River
Colorado River
Dolores River
Gunnison River
Bear River
Sevier River
Virgin River
Escalante River
Dirty Devil River
Fremont River
Price River
Duchesne River
Uinta River
Weber River
Provo River
Jordan River
Sevier Lake
Utah Lake
Sanpete Valley
Castle Valley
Emery Valley
Ferron Valley
Gunnison Valley
Sevier Valley
Parowan Valley
Cedar Valley
Escalante Valley
Tropic Valley
Bicknell Valley
Loa Valley
Hanksville Valley
Green River Valley
Castle Dale Valley
Huntington Valley
Ferron Valley
Emery Valley
Orangeville Valley
Wellington Valley
Helper Valley
Duchesne Valley
Roosevelt Valley
Manila Valley
Vernon Valley
Grantsville Valley
Stockton Valley
Ophir Valley
Dugway Valley
Knolls Valley
Gunnison Valley
Sanpete Valley
Sevier Valley
Piute Valley
Wayne Valley
Garfield Valley
Kane Valley
Washington Valley
Iron Valley
Beaver Valley
Millard Valley
Juab Valley
Tooele Valley
Rich Valley
Cache Valley
Box Elder Valley
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Summit Valley
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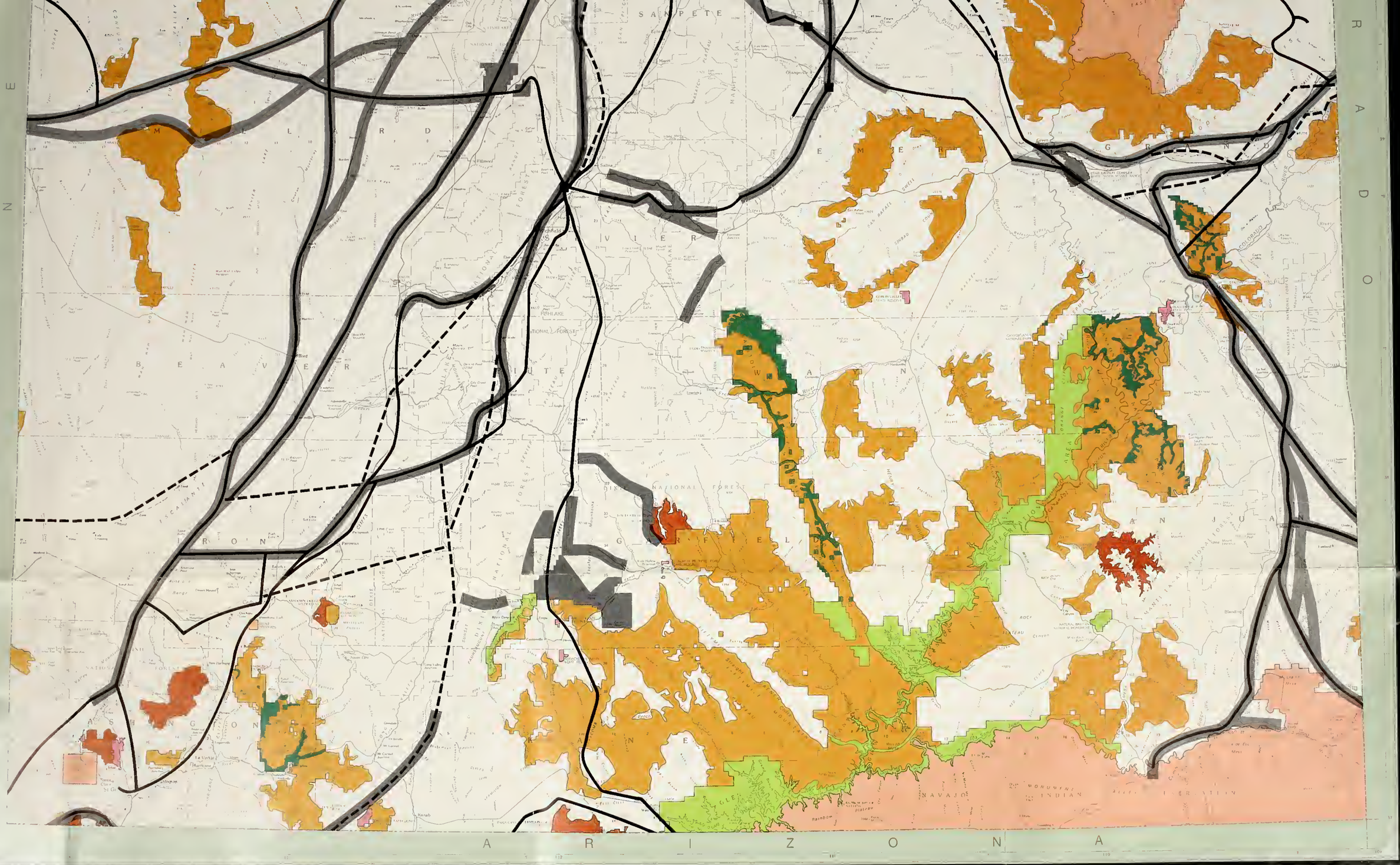
Uintah Valley
Duchesne Valley
Carbon Valley
Emery Valley
Grand Valley
San Juan Valley



LEGEND

- Wilderness Area
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- Wild & Scenic River
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- Other Federal Land*
- State Designated Land
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- Proposed Corridor
- Agency Designated Corridor
- Corridor Window
- Energy Source

SCALE 1:750,000

0 5 10 20 30 40 Miles

*Includes National Monuments, National Recreation Areas & National Scenic Areas

UTAH

WESTERN REGIONAL CORRIDOR STUDY

UTAH

PREPARED FOR WESTERN UTILITY GROUP
BY MICHAEL CLAYTON & ASSOCIATES

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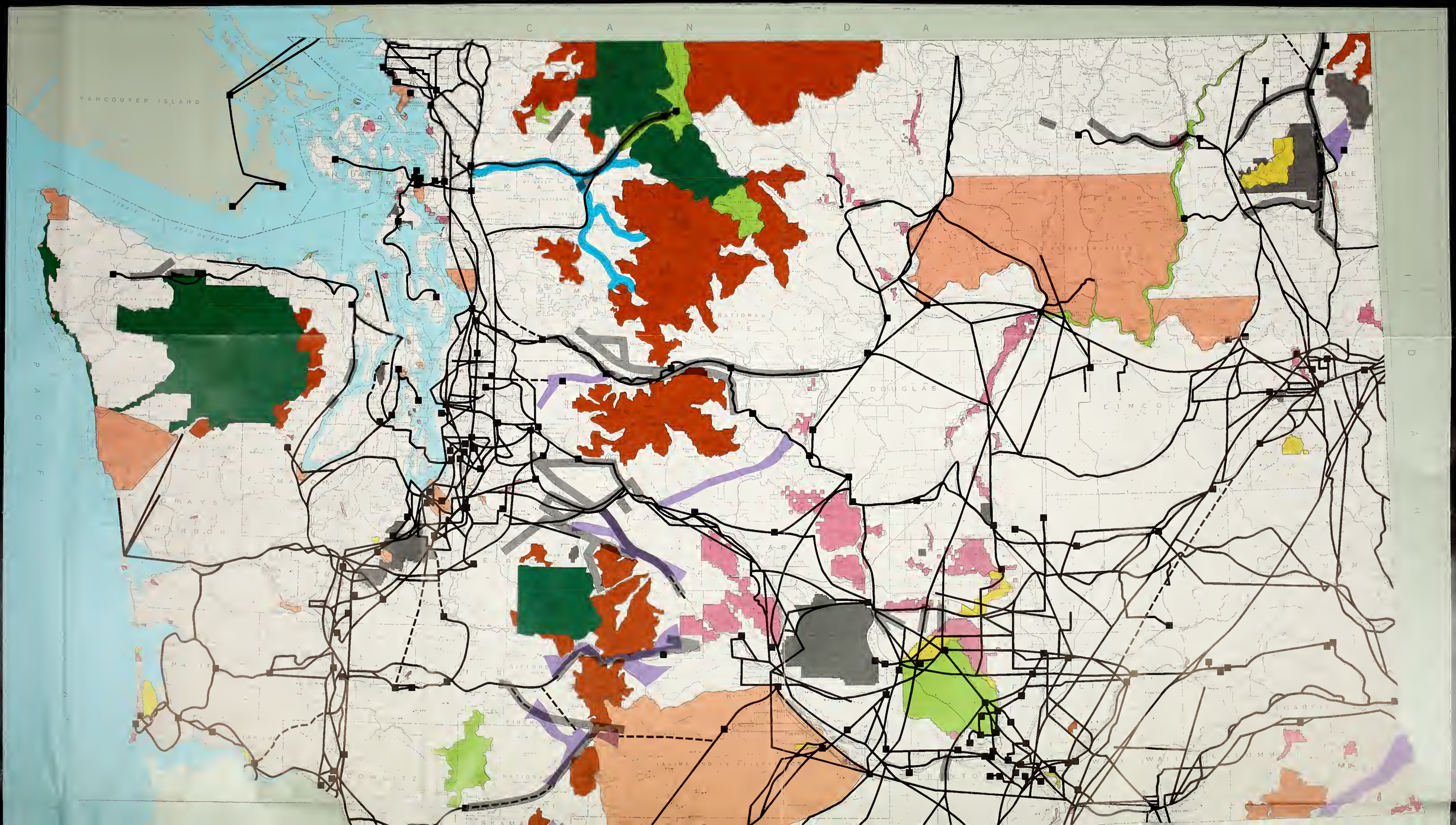
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STRAIT OF JUAN DE FUCA
SAN JUAN
DOUGLAS
LINCOLN
GRAYS HARBOR
GIFFORD PINCHOT NATIONAL FOREST
COWLITZ
SKAMANIA
WALLA WALLA
GARFIELD
PACIFIC

LEGEND

- Wilderness Area
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- National Conservation Area
- National Wildlife Refuge
- Wild & Scenic River
- Military Use Area
- Other Federal Land*
- State Designated Land
- Existing Corridor
- Proposed Corridor
- Agency Designated Corridor
- Corridor Window
- Energy Source

SCALE 1:[illegible]0,000

0 5 10 20 30 40 Miles

*Includes National Monuments, National Recreation Areas & National Scenic Areas

WASHINGTON

WESTERN REGIONAL CORRIDOR STUDY

WASHINGTON

PREPARED FOR WESTERN UTILITY GROUP
BY MICHAEL CLAYTON & ASSOCIATES

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MONTANA
SOUTH DAKOTA
BIG HORN
JOHNSON
WESTON
CONVERSE
NIOBRARA
HOT SPRINGS
WIND RIVER
SUBLETTE

LEGEND

- Wilderness Area
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- National Park
- National Conservation Area
- National Wildlife Refuge
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- Military Use Area
- Other Federal Land*
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- Proposed Corridor
- Agency Designated Corridor
- Corridor Window
- Energy Source

SCALE 1:7,000,000

0 10 20 30 40 Miles

*Includes National Monuments, National Recreation Areas & National Scenic Areas

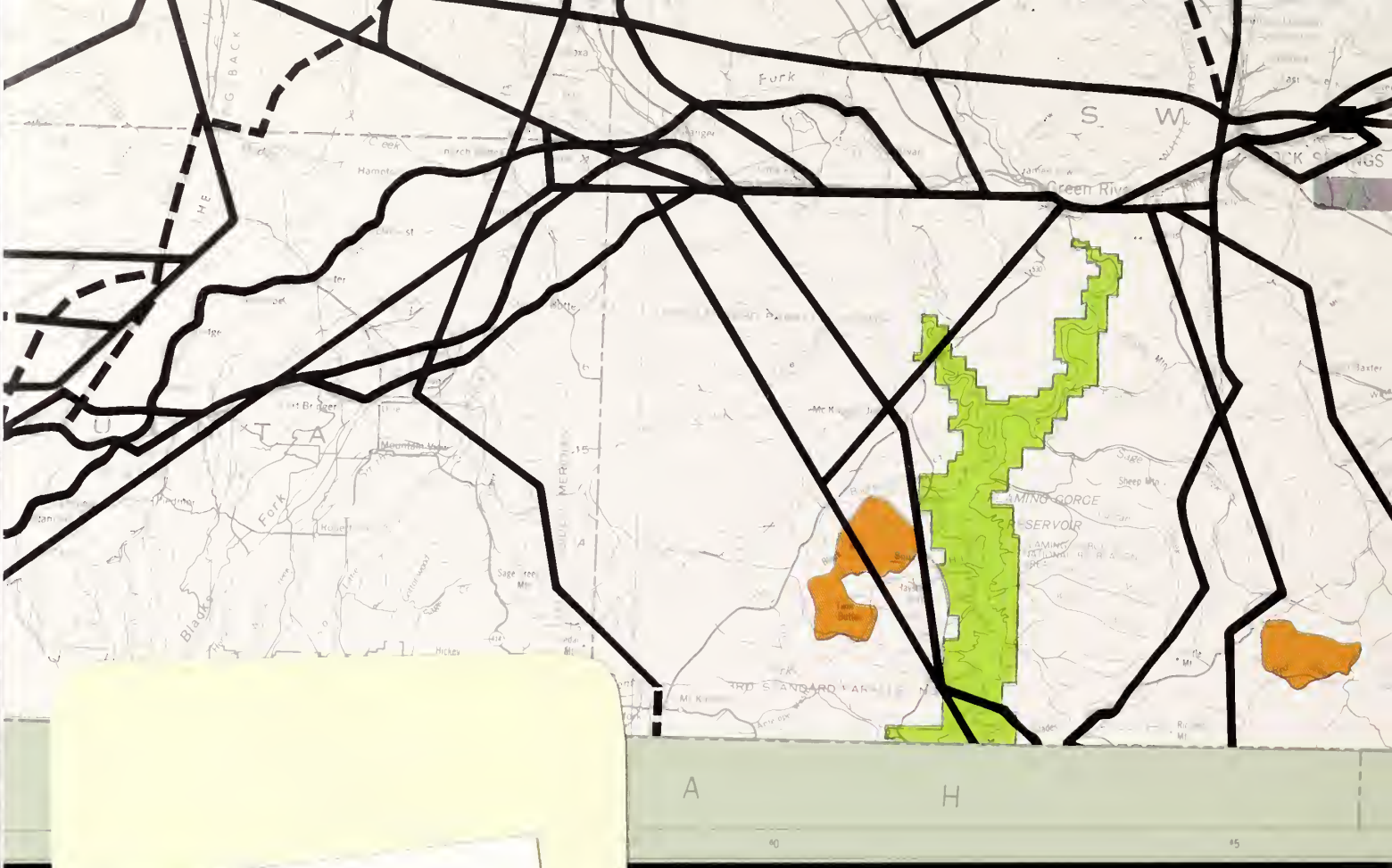
WYOMING

WESTERN REGIONAL CORRIDOR STUDY

WYOMING

PREPARED FOR WESTERN UTILITY GROUP
BY MICHAEL CLAYTON & ASSOCIATES

PUBLISHED BY UTAH POWER & LIGHT COMPANY



Form 1279-3
(June 1984)
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HD 242.9 .W47 1992
Western regional
study
DATE
LOANED
BORROWER
USDI – BLM

HD 242.9 .W47 1992 c.2

Western regional corridor
study

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SC-653, BLDG. 50
DENVER FEDERAL CENTER
P. O. BOX 25047
DENVER, CO 80225-0047

ife Refuge

River

rea

and*

d Land

Existing Corridor

Proposed Corridor

Agency Designated Corridor

Corridor Window

Energy Source

*Includes National Monuments, National Recreation Areas & National Scenic Areas